

TN

24

C3

A3

no.64-66

LIBRARY  
UNIVERSITY OF CALIFORNIA  
DAVIS





**CALIFORNIA STATE MINING BUREAU**

FERRY BUILDING, SAN FRANCISCO

**WILLIAM H. STORMS** - - - - **State Mineralogist**

**BULLETIN No. 64**

**SAN FRANCISCO, NOVEMBER, 1912**

# Mineral Production for 1911

By **E. S. BOALICH**, Statistician



**LIBRARY**  
**UNIVERSITY OF CALIFORNIA**  
**DAVIS**

**FRIEND WM. RICHARDSON, SUPERINTENDENT OF STATE PRINTING**  
**SACRAMENTO, CALIFORNIA**  
**1912**

**LIBRARY**  
**UNIVERSITY OF CALIFORNIA**

LIBRARY  
OF THE  
UNITED STATES  
DEPARTMENT OF AGRICULTURE

~~294.9~~  
*Class* ~~C 12 B~~  
~~64~~  
*Book* \_\_\_\_\_





# CALIFORNIA STATE MINING BUREAU

FERRY BUILDING, SAN FRANCISCO

WILLIAM H. STORMS - - - - State Mineralogist

BULLETIN No. 64

SAN FRANCISCO, NOVEMBER, 1912

# Mineral Production for 1911

By E. S. BOALICH, Statistician



FRIEND WM. RICHARDSON, SUPERINTENDENT OF STATE PRINTING

SACRAMENTO, CALIFORNIA

1912

## CALIFORNIA STATE MINING BUREAU.

W. H. STORMS     -     -     -     -     -     -     -     State Mineralogist.

### BOARD OF TRUSTEES.

A. H. WARD, Alameda     -     -     -     -     -     -     -     President.  
HENRY E. MONROE, San Francisco     -     -     -     -     -     -     -     Secretary.  
CALVEET WILSON, Los Angeles.  
E. C. HUTCHINSON, San Francisco.

### STAFF.

E. B. PRESTON-----Determinative Mineralogist.  
F. L. LOWELL -----Curator.  
WALTER W. BRADLEY-----Librarian  
E. S. BOALICH-----Statistician.  
W. W. THAYER-----Secretary.

# TABLE OF CONTENTS.

	PAGE		PAGE
THE MINERAL INDUSTRY IN 1911.....	5		
MINERAL SUBSTANCE, AMOUNT AND VALUE, 1911.....	6		
MINERALS PRODUCED IN 1910 AND 1911.....	7		
TOTAL PRODUCTION BY COUNTIES, 1911.....	8		
TOTAL GOLD PRODUCTION OF CALIFORNIA.....	9		
TOTAL PETROLEUM PRODUCTION OF CALIFORNIA.....	10		
TOTAL CEMENT PRODUCTION OF CALIFORNIA.....	11		
ITEMIZED OUTPUT, BY MINERAL, 1911.....	12		
	PAGE		PAGE
ANTIMONY .....	12	LEAD .....	25
ASBESTOS .....	12	LIME AND LIMESTONE .....	25
ASPHALT .....	12	MACADAM .....	17
BARYTES .....	13	MAGNESITE .....	26
BISMUTH .....	13	MANGANESE .....	26
BITUMINOUS ROCK .....	13	MARBLE .....	26
BORAX .....	13	MINERAL PAINT .....	27
CEMENT .....	14	MINERAL WATER .....	27
CHROME .....	14	NATURAL GAS .....	28
CLAY BRICK .....	14	ONYX AND TRAVERTINE .....	28
CLAY POTTERY .....	15	PAVING BLOCKS .....	28
COAL .....	16	PETROLEUM .....	29
COPPER .....	16	PLATINUM .....	29
CRUSHED ROCK .....	16	PYRITE .....	29
FELDSPAR .....	20	QUICKSILVER .....	30
FULLER'S EARTH .....	20	RUBBLE .....	18
GEMS .....	20	SALT .....	31
GOLD .....	22	SAND-GLASS .....	31
GRANITE .....	22	SANDSTONE .....	32
GRAPHITE .....	23	SILVER .....	32
GYPNUM .....	24	SODA .....	33
INFUSORIAL EARTH .....	24	TUNGSTEN .....	33
IRON ORE .....	24	ZINC .....	33
ITEMIZED OUTPUT BY COUNTIES, ARRANGED ALPHABETICALLY, 1911.....	35		
LIST OF PUBLICATIONS OF STATE MINING BUREAU.....	47		



# MINERAL INDUSTRY, CALIFORNIA, 1911.

---

Data Compiled from Direct Returns from Producers in Answer to Inquiries  
sent out by California State Mining Bureau, Ferry Building,  
San Francisco.

---

By E. S. BOALICH, Statistician.

---

## THE MINERAL INDUSTRY OF CALIFORNIA IN 1911.

Fifty-five out of the fifty-eight counties in California reported a production of one or more of forty minerals during the year 1911, amounting to a total value of \$87,497,879. This value, and all others mentioned in this Bulletin, are for crude material at the property.

The above total as compared with the 1910 output of \$88,419,079 shows an apparent decrease in 1911 of \$921,200. The two amounts are not strictly comparable, however, because of the fact that the 1910 total contains the value of refined asphalt produced during that year. In the 1911 figures this material, the value of which equals \$2,250,000, has been excluded, as no natural asphalt is produced in the State and therefore could not be included without duplication of a portion of the petroleum output. This also applies to other refined mineral products, which includes kerosene, gasoline and other products of the fractional distillation of crude petroleum. Petroleum is treated in this report as a whole, and to add to the output the value of these refined products would be a duplication of figures, which no matter how gratifying in swelling the grand total, would be not only misleading, but improper.

As has been the case in recent years, petroleum production leads all others by a wide margin, the total output for the year amounting to 84,648,157 barrels, valued at \$40,552,088. Gold comes second with a value of \$19,738,908. Cement ranks third, the total output amounting to 6,371,369 barrels, worth \$9,085,625. Although greatly curtailed owing to smelter-fume troubles, copper holds fourth place on the list with a production valued at \$4,604,753. Other minerals, each with a value of over a million dollars, are as follows: Crushed rock, including sand and gravel, \$3,610,357; brick, \$2,638,121; borax, \$1,456,672.

It will be observed that the increase in the value of the output of cement was nearly \$3,300,000 over that of the previous year. It may be expected that the present year, 1912, will see this amount swelled to a figure well over \$10,000,000.

The following table shows the yield of mineral substances of California for 1911 as compiled from the returns received at the State Mining Bureau, San Francisco, in answer to inquiries sent to producers:

Substance.	Amount.	Value.
Asbestos -----	125 tons	\$500 00
Barytes -----	309 tons	2,207 00
Bituminous rock -----	75,125 tons	117,279 00
Borax -----	50,945 tons	1,456,672 00
Cement -----	6,371,369 bbls.	9,085,625 00
Chrome -----	935 tons	14,197 00
Clay, brick -----	327,474 M	2,638,121 00
Clay, pottery -----	224,576 tons	252,759 00
Coal -----	11,047 tons	18,297 00
Copper -----	36,838,024 lbs.	4,604,753 00
Crushed rock -----	6,487,223 tons	3,610,357 00
Feldspar -----	740 tons	4,560 00
Fuller's earth -----	466 tons	5,294 00
Gems -----		51,824 00
Gold -----		19,738,908 00
Granite -----	401,209 cu. ft.	355,742 00
Gypsum -----	31,457 tons	101,475 00
Infusorial earth -----	2,194 tons	19,670 00
Iron ore -----	558 tons	558 00
Lead -----	1,403,839 lbs.	63,173 00
Lime -----	429,587 bbls.	390,988 00
Limestone -----	516,398 tons	452,790 00
Magnesite -----	8,858 tons	67,430 00
Manganese -----	2 tons	40 00
Marble -----	20,201 cu. ft.	54,103 00
Mineral paint -----	186 tons	1,184 00
Mineral water -----	2,637,669 gals.	590,654 00
Natural gas -----		491,859 00
Paving blocks -----	4,141 M	210,819 00
Petroleum -----	84,648,157 bbls.	40,552,088 00
Platinum -----	511 oz.	14,873 00
Pyrite -----	54,225 tons	182,954 00
Quicksilver -----	19,109 flasks	879,205 00
Salt -----	173,332 tons	324,255 00
Sand, glass -----	8,620 tons	8,672 00
Sandstone -----	255,313 cu. ft.	127,314 00
Silver -----		673,336 00
Soda -----	9,023 tons	52,887 00
Tungsten -----		127,706 00
Zinc -----	2,679,842 lbs.	152,751 00
Total -----		\$87,497,879 00

The following pages treat in detail of the production by county as well as by mineral. Some counties are much larger producers of mineral than others. Kern County for instance produced last year more than \$20,000,000 worth of petroleum, and Fresno County's oil production exceeded \$9,300,000, while that of Los Angeles was over \$3,300,000. The largest copper producer was Shasta County with nearly \$3,700,000, and that of Calaveras County was \$773,769. Nine counties produced the remainder of a total of \$4,604,753.

The following table shows the comparative value of minerals produced in California during the years 1910 and 1911:

Mineral.	1910.	1911.
Asbestos -----	\$20,000 00	\$500 00
Asphalt -----	2,125,122 00	<sup>1</sup>
Barytes -----	5,640 00	2,207 00
Bituminous rock -----	165,711 00	117,279 00
Borax -----	1,177,960 00	1,456,672 00
Cement -----	7,485,715 00	9,085,625 00
Chrome -----	9,707 00	14,197 00
Clay, brick -----	2,934,731 00	2,638,121 00
Clay, pottery -----	324,099 00	252,759 00
Coal -----	23,484 00	18,297 00
Copper -----	6,680,641 00	4,604,753 00
Crushed rock -----	<sup>2</sup>	3,610,357 00
Feldspar -----	5,720 00	4,560 00
Fuller's earth -----	3,820 00	5,294 00
Gems -----	237,475 00	51,824 00
Gold -----	19,715,440 00	19,738,908 00
Granite -----	417,898 00	<sup>3</sup> 355,742 00
Gypsum -----	129,152 00	101,475 00
Infusorial earth -----	17,617 00	19,670 00
Iron ore -----	900 00	558 00
Lead -----	134,082 00	63,173 00
Lime -----	1,053,891 00	390,988 00
Limestone -----	<sup>4</sup>	452,790 00
Macadam -----	1,104,526 00	<sup>5</sup>
Magnesite -----	113,887 00	67,430 00
Manganese -----	4,235 00	40 00
Marble -----	50,200 00	54,103 00
Mineral paint -----	2,040 00	1,184 00
Mineral water -----	522,009 00	590,654 00
Natural gas -----	1,676,367 00	491,859 00
Paving blocks -----	198,916 00	210,819 00
Petroleum -----	37,689,542 00	40,552,088 00
Platinum -----	8,386 00	14,873 00
Pyrite -----	179,862 00	182,954 00
Quicksilver -----	799,002 00	879,205 00
Rubble -----	1,673,164 00	<sup>5</sup>
Salt -----	395,417 00	324,255 00
Sand, glass -----	8,165 00	8,672 00
Sand, quartz -----	10,100 00	-----
Sandstone -----	80,443 00	127,314 00
Silver -----	993,646 00	673,336 00
Slate -----	8,000 00	-----
Soapstone -----	7,260 00	-----
Soda -----	11,862 00	52,887 00
Tungsten -----	208,245 00	127,706 00
Zinc -----	-----	152,751 00
Total -----	\$88,419,079 00	\$87,497,879 00

<sup>1</sup>Not included.

<sup>2</sup>Macadam and rubble.

<sup>3</sup>Including curbing.

<sup>4</sup>Included in lime.

<sup>5</sup>Included in crushed rock.

The following tabulation shows the comparative mineral production of the various counties of the State during the two years, 1910 and 1911:

County.	1910.	1911.
Alameda -----	\$1,205,387 00	\$799,639 00
Amador -----	2,785,767 00	2,993,670 00
Butte -----	2,529,179 00	2,406,856 00
Calaveras -----	2,026,166 00	1,970,059 00
Colusa -----	148,005 00	138,227 00
Contra Costa -----	484,923 00	594,256 00
Del Norte -----	5,845 00	1,750 00
El Dorado -----	194,631 00	153,918 00
Fresno -----	9,505,699 00	9,711,463 00
Glenn -----	34,020 00	51,430 00
Humboldt -----	77,437 00	76,858 00
Imperial -----	97,656 00	105,044 00
Inyo -----	704,473 00	710,033 00
Kern -----	19,614,014 00	21,176,534 00
Kings -----	10,085 00	900 00
Lake -----	142,427 00	100,296 00
Lassen -----	83,152 00	1
Los Angeles -----	5,525,317 00	5,407,863 00
Madera -----	133,766 00	80,201 00
Marin -----	183,885 00	232,731 00
Mariposa -----	346,245 00	175,752 00
Mendocino -----	500 00	1,600 00
Merced -----	71,064 00	49,548 00
Modoc -----	5,513 00	20,238 00
Mono -----	445,115 00	298,405 00
Monterey -----	162,523 00	74,536 00
Napa -----	244,410 00	220,399 00
Nevada -----	2,553,204 00	2,219,214 00
Orange -----	3,220,164 00	4,113,585 00
Placer -----	583,659 00	539,246 00
Plumas -----	200,870 00	230,010 00
Riverside -----	507,406 00	622,489 00
Sacramento -----	1,660,970 00	2,109,678 00
San Benito -----	584,343 00	558,846 00
San Bernardino -----	447,836 00	710,108 00
San Diego -----	374,874 00	419,008 00
San Francisco -----	120,126 00	119,636 00
San Joaquin -----	376,149 00	189,593 00
San Luis Obispo -----	215,322 00	75,556 00
San Mateo -----	279,872 00	233,985 00
Santa Barbara -----	5,334,960 00	3,411,107 00
Santa Clara -----	420,782 00	461,611 00
Santa Cruz -----	400,794 00	338,814 00
Shasta -----	8,203,677 00	5,406,461 00
Sierra -----	313,365 00	467,117 00
Siskiyou -----	527,178 00	553,037 00
Solano -----	255,169 00	188,848 00
Sonoma -----	283,113 00	238,610 00
Stanislaus -----	223,061 00	315,219 00
Tehama -----	4,400 00	500 00
Trinity -----	508,433 00	620,950 00
Tulare -----	206,050 00	158,335 00
Tuolumne -----	755,591 00	1,240,734 00
Ventura -----	392,974 00	362,810 00
Yuba -----	3,209,645 00	3,011,689 00
Unapportioned -----	9,487,888 00	11,028,877 00
Totals -----	\$88,419,079 00	\$87,497,879 00

<sup>1</sup>Included in Colusa figures.

A glance at the above tabulated statement will give the best idea of the relative production of the various counties. It will be observed that out of the fifty-eight counties of the State fifty-five contributed to the mineral output of 1911.

The figures opposite "unapportioned" are necessary because of the fact that some branches of the mineral industry are so centralized, that if the value of their output were listed under the county from which they come private business would be made public. For this reason there are several instances where the real value of the county mineral yield is much greater than is shown in the above summary.

The omission of the value of asphalt in the 1911 figures is accountable for an undue decrease in the case of counties where oil refineries are located. The figures for 1910 included asphalt, which was in fact a partial duplication of petroleum value.

#### TOTAL GOLD PRODUCTION OF CALIFORNIA.

The following table was compiled by Chas. G. Yale, of the Division of Mineral Resources, U. S. Geological Survey, but for a number of years Statistician of the California State Mining Bureau and the U. S. Mint at San Francisco. The authorities chosen for certain periods were: J. D. Whitney, State Geologist of California; John Arthur Phillips, author of "Mining and Metallurgy of Gold and Silver" (1867); U. S. Mining Commissioner R. W. Raymond; U. S. Mining Commissioner J. Ross Browne; Wm. P. Blake, Commissioner from California to the Paris Exposition, where he made a report on "Precious Metals" (1867); John J. Valentine, author for many years of the annual report on Precious Metals published by Wells Fargo and Company's Express; and Louis A. Garnett, in the early days manager of the San Francisco refinery where records of gold receipts and shipments were kept. Mr. Yale obtained other data from the reports of the Director of the U. S. Mint and the Director of the U. S. Geological Survey. The authorities referred to, who were alive at the time of the original compilation of this table in 1894, were all consulted in person or by letter by Mr. Yale with reference to the correctness of their published data, and the final table quoted was then made up. The figures of the last six years are those prepared for the U. S. Geological Survey.

The table shows that California has produced a total of about \$1,548,000,000 in gold since 1848. This enormous amount of gold would weigh about 2,580 tons and would require a train of 52 freight cars, each holding fifty tons of the metal. What the ultimate production of gold in California will be, only the future can tell, but at the present the total is being swelled at the rate of about \$20,000,000 annually, and this amount is likely to become more rather than less, for some years to come. It will be observed that the largest production for any one year was in 1852, when it reached \$81,294,700. This was at the time of the most active development of the superficial placers, when thousands of men were at work with pan, rocker, long-tom and sluice, and even the hydraulic method had been introduced in a small way.

## Total Gold Product of California, 1848-1911.

Year.	Amount.	Year.	Amount.
1848 -----	\$245,301 00	1881 -----	\$19,223,155 00
1849 -----	10,151,360 00	1882 -----	17,146,416 00
1850 -----	41,273,106 00	1883 -----	24,316,873 00
1851 -----	75,988,232 00	1884 -----	13,600,000 00
1852 -----	81,294,700 00	1885 -----	12,661,044 00
1853 -----	67,613,487 00	1886 -----	14,716,506 00
1854 -----	69,433,931 00	1887 -----	13,588,614 00
1855 -----	55,485,395 00	1888 -----	12,750,000 00
1856 -----	57,509,411 00	1889 -----	11,212,913 00
1857 -----	43,628,172 00	1890 -----	12,309,793 00
1858 -----	46,591,140 00	1891 -----	12,728,869 00
1859 -----	45,846,599 00	1892 -----	12,571,900 00
1860 -----	44,095,163 00	1893 -----	12,422,811 00
1861 -----	41,884,995 00	1894 -----	13,923,281 00
1862 -----	38,854,668 00	1895 -----	15,334,317 00
1863 -----	23,501,736 00	1896 -----	17,181,562 00
1864 -----	24,071,423 00	1897 -----	15,871,401 00
1865 -----	17,930,858 00	1898 -----	15,906,478 00
1866 -----	17,123,867 00	1899 -----	15,336,031 00
1867 -----	18,265,452 00	1900 -----	15,863,355 00
1868 -----	17,555,867 00	1901 -----	16,989,044 00
1869 -----	18,229,044 00	1902 -----	16,910,320 00
1870 -----	17,458,133 00	1903 -----	16,471,264 00
1871 -----	17,477,885 00	1904 -----	19,109,600 00
1872 -----	15,482,194 00	1905 -----	19,197,043 00
1873 -----	15,019,210 00	1906 -----	18,732,452 00
1874 -----	17,264,836 00	1907 -----	16,727,928 00
1875 -----	16,876,009 00	1908 -----	18,761,559 00
1876 -----	15,610,723 00	1909 -----	20,237,870 00
1877 -----	16,501,268 00	1910 -----	19,715,440 00
1878 -----	18,839,141 00	1911 -----	19,738,908 00
1879 -----	19,626,654 00		
1880 -----	20,030,761 00	Total -----	\$1,547,967,468 00

This Bureau has never independently collected statistics of gold and silver output, but has used totals and distribution by county, as obtained from the U. S. Geological Survey. All gold, silver, and platinum figures in this Bulletin are derived from this source.

## Petroleum production in California—1875-1911.

For the early years of petroleum production in California the statistical records are rather incomplete, especially as to price. In Bulletin No. 60, California State Mining Bureau, the total value of petroleum produced from 1887 to 1909, inclusive, is given as \$136,693,228. Adding to this amount the value of the 1910 and 1911 output gives a grand total of \$214,934,858 for the value of the petroleum produced in the State during the past twenty-five years.

The following table is of much interest to all who are engaged in the production of petroleum. It was about twenty years before the output of the entire State reached the dignity of a million barrels annually. Within the past ten years the annual production has increased with little fluctuation from about 14,000,000 barrels to over 84,000,000 barrels annually.

Amount of annual production, by barrels, is given in the following table. (The number of barrels credited to the year 1875 represents all production up to and including that date):

Year.	Barrels.	Year.	Barrels.
1875 -----	175,000	1895 -----	1,245,339
1876 -----	12,000	1896 -----	1,257,780
1877 -----	13,000	1897 -----	1,911,569
1878 -----	15,227	1898 -----	2,249,088
1879 -----	19,858	1899 -----	2,677,875
1880 -----	40,552	1900 -----	4,329,950
1881 -----	99,862	1901 -----	7,710,315
1882 -----	128,636	1902 -----	14,356,910
1883 -----	142,857	1903 -----	24,340,839
1884 -----	262,000	1904 -----	29,736,003
1885 -----	325,000	1905 -----	34,275,701
1886 -----	377,145	1906 -----	32,624,000
1887 -----	678,572	1907 -----	40,311,171
1888 -----	690,333	1908 -----	48,306,910
1889 -----	303,220	1909 -----	58,191,723
1890 -----	307,360	1910 -----	77,697,568
1891 -----	323,600	1911 -----	84,648,157
1892 -----	385,049		
1893 -----	470,179	Total (barrels) -----	471,423,426
1894 -----	783,078		

#### Cement production in California—1891-1911.

Cement was first commercially produced in the State in 1891. While the total figures are not of the same magnitude as those for gold and petroleum the growth of the industry has been stupendous, and a comparison of the annual figures representing the output since the inception of the industry is of interest.

Year.	Amount, barrels.	Value.
1891 -----	5,000	\$15,000 00
1892 -----	5,000	15,000 00
1893 -----		
1894 -----	8,000	21,600 00
1895 -----	16,383	32,556 00
1896 -----	9,500	28,250 00
1897 -----	18,000	66,000 00
1898 -----	50,000	150,000 00
1899 -----	60,000	180,000 00
1900 -----	52,000	121,000 00
1901 -----	71,800	159,842 00
1902 -----	171,000	423,600 00
1903 -----	640,868	968,727 00
1904 -----	969,538	1,539,807 00
1905 -----	1,265,553	1,791,916 00
1906 -----	1,286,000	1,941,250 00
1907 -----	1,613,563	2,585,577 00
1908 -----	1,629,615	2,359,692 00
1909 -----	3,779,205	4,969,437 00
1910 -----	5,453,193	7,485,715 00
1911 -----	6,371,369	9,085,625 00
Totals -----	23,475,587	\$33,940,594 00

**Antimony.**

Antimony deposits have been worked in a small way in the past, in Inyo, Kern, Riverside, and San Benito counties. No production has been reported since 1901 although in the present year, 1912, there has been some active development work done and a renewed output of this metal is looked for in the near future. Antimony occurs in some other localities than those above mentioned.

*Reference:* Bull. 38:62. Eighth Report, p. 485. Tenth Report, p. 515. Eleventh Report, p. 371. Thirteenth Report, p. 31.

**Asbestos.**

Deposits of asbestos are located in Amador, Butte, El Dorado, Fresno, Placer, Riverside, San Bernardino, San Diego, Sierra and Trinity counties. There are surface indications of the mineral in many other counties but, to date, little if any development work has been done upon them. The actual production of asbestos in California is very small, the amount reported to the State Mining Bureau being only 125 tons, valued at \$500, for 1911. Less than 10 per cent of the asbestos used in the United States is produced in this country, and of this amount practically all is mined in the Eastern and Middle Western states. The great bulk of the raw product is imported from Canada where a high grade of asbestos of long fiber and great tensile strength is produced.

The uses of this mineral are many and constantly increasing, and as the requirements for asbestos in California increase the industry will in time become an important one in this State.

The lower grades, used in fireproof roofing, etc., bring a price of about \$20 per ton, and from this figure the price goes up as high as \$200 per ton for asbestos which is suitable for the manufacture of curtains and tapestries and other fabrics, as well as for steam packing, friction facing for brakes, insulating tapes, etc.

Two distinct minerals are known on the market as asbestos. One is called tremolite, the other chrysotile. These are trade terms. The latter is superior in strength and flexibility.

For complete information regarding the properties of this mineral, and location of deposits in California, see Bulletin No. 38, p. 261.

**Asphalt.**

Natural asphalt exists in small amount in Kern, Los Angeles, Monterey, San Luis Obispo, Santa Barbara, Santa Clara, Santa Cruz, and Ventura counties. For economic reasons refined asphalt, only, has been commercially used in the State in recent years. In excess of 180,000 tons of the refined product were produced from petroleum in California during 1911, having a value exceeding \$2,250,000. These figures are not used in the total mineral production of the State because the value

of the crude petroleum from which it is made has been included, and the addition of the value of this by-product would give an erroneous result, too high by the above amount.

Oil refineries are situated in the following counties: Alameda, Contra Costa, Fresno, Kern, Los Angeles, San Diego, Santa Barbara, San Luis Obispo, San Francisco, and Ventura.

California's production of asphalt in 1911 was greater than the entire amount imported into the United States from all foreign countries. It is used principally in street paving; also for roofing, water-proofing, insulating and as a preservative for piling, etc.

#### Barytes.

Deposits of barytes are known in Butte, Mariposa, Shasta, and San Bernardino counties. Production in the State for the year 1911 amounted to 309 tons valued at \$2,207, or an average value of a little more than \$7 per ton. This is for crude material at the property. If the product is sorted and ground the average price obtained is about double the figure named.

Its principal uses are in the paint industry, in the manufacture of paper and rope, in the tanning of leather, and in the refining of sugar.

The demand for barytes is increasing.

#### Bismuth.

Bismuth is not abundant in California although an important locality has been reported, viz., near the head of Thousand Palm Cañon in Riverside County, about 25 miles northeasterly from Indio, at the Lang copper mine.

#### Bituminous rock.

San Luis Obispo, Santa Cruz, and Solano counties reported production of bituminous rock in 1911, to the amount of 75,125 tons valued at \$117,279. Used entirely in road building. Distributed as follows:

County.	Amount, tons.	Value.
San Luis Obispo -----	2,710	\$5,230 00
Santa Cruz -----	24,815	80,371 00
Solano -----	47,600	31,678 00
Totals -----	75,125	\$117,279 00

#### Borax.

Deposits of borax are known in Inyo, Kern, Lake, Los Angeles, Imperial, San Bernardino, Solano, Tehama, and Ventura counties. In the desert portions of the State its occurrence is more or less common in the beds of ancient lakes. In other places it is mined as an ore, chiefly colemanite, which occurs in vein-like masses. The output in

California, which is the sole domestic source of borax, in 1911 amounted to 50,945 tons valued at \$1,456,672.

#### Cement.

The growth of the cement industry has been one of the noteworthy features of the mineral industry in recent years. The first authentic reported production of cement in California was in 1891 when 5,000 barrels, valued at \$15,000, represented the output. During 1911 the production was 6,371,369 barrels, valued at \$9,085,625, or an increase of 918,176 barrels, and \$1,599,910 in value over the previous year, when the yield amounted to 5,453,193 barrels worth \$7,485,715. The great and growing popularity of concrete buildings and other structures in the State is largely responsible for the above remarkable showing. In value of annual output cement is now surpassed only by petroleum and gold.

The industry, as is the case with one or two others, is so highly centralized that it is impossible to apportion the production to the counties in which the plants are located without making private business public.

#### Chrome.

Chrome, or chromite, is produced in California to a very limited extent although the deposits are the most extensive of any in the United States. Chrome has been mined in the following counties: Alameda, Calaveras, Del Norte, Fresno, Glenn, Lake, Placer, San Benito, San Luis Obispo, Shasta, Siskiyou, Sonoma, Tehama, Trinity, and Tuolumne.

During 1911 the reported production of chromite was as follows:

County.	Amount, tons.	Value.
Alameda -----	60	\$500 00
Shasta -----	875	13,697 00
Totals -----	935	\$14,197 00

#### Clay brick.

Brick of every description including clay, magnesite, sand lime, common, pressed and glazed, were produced in California during 1911 to the amount of 327,474 M valued at \$2,638,121, as compared with 340,883 M worth \$2,934,731 manufactured and sold in 1910. The decrease is due to overproduction in 1910 as well as to a natural falling off owing to the unprecedented gain in concrete construction of all kinds.

Clays are abundant in many counties of California, and large industries have been built up in the manufacture of the great variety of clay products. There is less really fine kaolin than is desired. However, a porcelain factory has been built at Richmond in Contra Costa County, where this refined branch of the clay industry is in a fair way to be carried to success.

The detailed figures tabulated by counties follows:

County.	Amount, M.	Value.
Alameda -----	19,660	\$153,330 00
Amador -----	2,000	20,000 00
Contra Costa -----	36,463	271,575 00
Fresno -----	4,500	28,500 00
Humboldt -----	357	2,880 00
Imperial -----	1,200	7,000 00
Kern -----	5,603	41,426 00
Los Angeles -----	160,259	1,442,913 00
Madera -----	270	1,350 00
Marin -----	19,695	87,445 00
Mendocino -----	160	1,600 00
Orange -----	1,650	11,550 00
Placer -----	700	18,000 00
Riverside -----	3,675	28,572 00
Sacramento -----	13,917	76,571 00
San Bernardino -----	1,340	8,040 00
San Diego -----	9,500	68,000 00
San Joaquin -----	5,275	49,650 00
San Luis Obispo -----	2,000	18,000 00
San Mateo -----	1,350	43,000 00
Santa Barbara -----	1,600	13,800 00
Santa Clara -----	6,000	30,000 00
Shasta -----	2,825	20,094 00
Solano -----	500	4,000 00
Stanislaus -----	850	5,950 00
Tulare -----	10,225	81,000 00
Ventura -----	900	5,100 00
Unapportioned -----	15,000	98,775 00
Totals -----	327,474	\$2,638,121 00

#### Clay—Pottery.

At one time or another pottery clays have been quarried in thirty-three different counties in the State, from Siskiyou in the north to San Diego in the south. The production as reported by operators for the year 1911 amounted to 224,576 tons valued at \$252,759 as compared with the output of 249,028 tons worth \$324,099 in 1910. From present indications this falling off is merely temporary as the first half of 1912 has seen the installation of several new plants for the handling of this product and the future prospects of the industry are of the brightest.

Following is a tabulation of the direct returns by counties:

County.	Amount, tons.	Value.
Alameda -----	10,500	\$8,300 00
Amador -----	43,352	37,395 00
Calaveras -----	50	200 00
Humboldt -----	937	937 00
Kern -----	242	121 00
Los Angeles -----	15,650	41,025 00
Monterey -----	1,100	4,950 00
Orange -----	2,000	3,200 00
Placer -----	43,120	29,200 00
Riverside -----	67,295	79,961 00
San Bernardino -----	920	4,060 00
San Joaquin -----	25,510	25,510 00
Santa Barbara -----	12,000	16,000 00
Ventura -----	1,900	1,900 00
Totals -----	224,576	\$252,759 00

**Coal.**

Coal deposits developed to a greater or less extent are found in the following counties of the State: Alameda, Amador, Calaveras, Colusa, Contra Costa, Del Norte, Fresno, Humboldt, Kern, Mendocino, Modoc, Monterey, Orange, Riverside, Sacramento, San Benito, San Diego, San Luis Obispo, Santa Clara, Shasta, Siskiyou, Sonoma, Stanislaus, Sutter, and Trinity. Actual production is small, amounting to but 11,047 tons valued at \$18,297 during 1911. Coal has been produced continuously in this State since 1861. Up to 1903 the annual output varied between 100,000 and 200,000 tons. With the advent of petroleum as a fuel the coal production has rapidly dwindled. With one or two exceptions California coal is a lignite of inferior quality.

**Copper.**

Copper is widely distributed throughout the State, the following counties containing copper ores: Alameda, Alpine, Amador, Calaveras, Colusa, Contra Costa, Del Norte, El Dorado, Fresno, Glenn, Humboldt, Inyo, Kern, Lassen, Los Angeles, Madera, Marin, Mariposa, Mendocino, Merced, Mono, Napa, Nevada, Placer, Plumas, Riverside, San Benito, San Bernardino, San Diego, San Luis Obispo, Santa Clara, Shasta, Sierra, Siskiyou, Sonoma, Stanislaus, Sutter, Tehama, Trinity, Tulare, Tuolumne, and Yuba.

Eleven counties reported production for the year 1911, the total amounting to 36,838,024 pounds valued at \$4,604,753, as compared with 53,721,032 pounds worth \$6,680,641 in 1910. The great decrease is due to the much discussed "fume" trouble between the smelters and the farmers of the various adjacent localities, as well as with the government. This difference, however, seems now to be in a fair way to finding a satisfactory solution.

**Copper Output for 1911 by Counties.**

County.	Amount, pounds.	Value.
Amador -----	227,848	\$28,481 00
Calaveras -----	6,190,153	773,769 00
Inyo -----	27,889	3,486 00
Kern -----	29,441	3,680 00
Madera -----	14,608	1,826 00
Mariposa -----	14,641	1,830 00
Nevada -----	1,665	209 00
Placer -----	118,624	14,828 00
Riverside -----	6,753	844 00
San Bernardino -----	666,489	83,311 00
Shasta -----	29,539,913	3,692,489 00
Totals -----	36,838,024	\$4,604,753 00

**Crushed rock.**

Under this general heading are included macadam, rubble, trap rock, riprap, sand and gravel. When producers in their answers to inquiries have stated the use to which their rock was put the classification has

been made accordingly. In a large number of cases, however, it is absolutely impossible for the producer himself to know how much of his output has been used in street work, how much in concrete construction, etc., and a tabulation of "Crushed Rock—Unclassified" has been made to cover such instances. The total crushed rock figures here given are comparable with the sum of the macadam and rubble figures as found in previous bureau publications.

During 1911 crushed rock was produced in California to the amount of 6,487,223 tons, having a value at the quarry of \$3,610,357. This is a marked increase over the 1910 output, which totaled 5,827,828 tons valued at \$2,777,690. Values of this class of material are far from uniform. Accessibility of the deposit, quality of the rock, labor conditions, etc., make each local case a separate and distinct one.

Thirty-three counties reported production of crushed rock in 1911. Without doubt the actual output is in excess of the figures given owing to the nature of the industry, and producers who have not received inquiries from the State Mining Bureau will do the State and their county a service if they will forward their names and addresses to the Statistician, California State Mining Bureau, Ferry Building, San Francisco, Cal.

Crushed rock is used for so many purposes that it is very difficult to properly segregate the amounts produced into the proper places. Among the uses of crushed rock are concrete for buildings, for walls, sidewalks and in machinery foundations. Also for macadamizing streets and for other uses. The larger rocks, used for filling embankments, building breakwaters and for similar uses are not included in crushed rock.

Following are given county figures for the various branches of the crushed rock industry as far as possible, as well as total figures covering the industry as a whole:

## Macadam.

County.	Amount, tons.	Value.
Alameda .....	180,413	\$135,148 00
Contra Costa .....	111,194	68,732 00
Humboldt .....	27,160	27,444 00
Los Angeles .....	110,000	77,500 00
Madera .....	1,300	800 00
Merced .....	90	54 00
Monterey .....	500	500 00
Napa .....	24,867	21,556 00
Sacramento .....	15,856	7,946 00
San Francisco .....	106,792	98,547 00
San Mateo .....	12,700	9,500 00
Santa Barbara .....	1,800	1,800 00
Santa Clara .....	837	558 00
Santa Cruz .....	5,543	5,543 00
Solano .....	116,000	92,800 00
Totals .....	715,052	\$548,428 00

## Rubble.

County.	Amount, tons.	Value.
Alameda .....	175,185	\$93,182 00
Colusa .....	66,035	16,502 00
Contra Costa .....	70,000	55,000 00
Humboldt .....	50	125 00
Inyo .....	46,450	32,555 00
Kern .....	143,500	99,330 00
Los Angeles .....	174,625	132,006 00
Marin .....	145,421	90,161 00
Napa .....	1,581	1,505 00
Orange .....	50	100 00
Placer .....	8,584	1,753 00
Riverside .....	13,525	7,038 00
Sacramento .....	14,264	2,202 00
San Bernardino .....	120,696	142,821 00
San Diego .....	2,479	2,740 00
Santa Barbara .....	1,038	4,102 00
Santa Cruz .....	2,084	2,084 00
Sonoma .....	110	55 00
Totals .....	985,677	\$683,261 00

## Unclassified.

Alameda .....	67,985	\$53,892 00
Butte .....	95,185	61,870 00
Contra Costa .....	180,864	107,145 00
El Dorado .....	7,284	5,465 00
Fresno .....	340,277	240,198 00
Los Angeles .....	441,826	292,153 00
Marin .....	28,225	18,625 00
Merced .....	102,990	46,794 00
Napa .....	82,012	42,972 00
Riverside .....	490,221	444,827 00
Sacramento .....	206,776	107,523 00
San Benito .....	250,322	107,558 00
San Bernardino .....	18,330	19,923 00
San Diego .....	110,917	129,874 00
San Francisco .....	28,000	16,479 00
San Mateo .....	53,668	51,525 00
Santa Barbara .....	300	450 00
Santa Clara .....	28,540	18,849 00
Solano .....	43,049	34,789 00
Sonoma .....	17,073	13,294 00
Ventura .....	1,000	750 00
Totals .....	2,594,844	\$1,814,955 00

## Trap and Riprap.

Alameda .....	104,277	\$58,708 00
Merced .....	3,670	2,700 00
San Diego .....	377	471 00
Totals .....	108,324	\$61,879 00

Paving blocks are mostly made from either granite or andesite, the latter known by the trade term "basalt blocks," are not included in any of the above, but will be found under a separate head. Large quantities of earth, gravel, and rock are annually moved by the railroads from their own quarries and in grading, which are used in filling embankments. Little of this output is included in the output of broken rock.

## Sand and Gravel.

County.	Amount, tons.	Value.
Alameda	424,945	\$63,635 00
Butte	136,153	16,338 00
Colusa	1,333	200 00
Contra Costa	93,756	26,626 00
Fresno	99,426	40,713 00
Glenn	421,775	51,430 00
Humboldt	7,533	10,187 00
Kern	87,450	8,550 00
Los Angeles	151,971	35,217 00
Monterey	34,617	26,511 00
Napa	130,272	61,395 00
Orange	7,510	755 00
Placer	15,884	6,177 00
Riverside	7,142	1,859 00
Sacramento	133,660	13,366 00
San Bernardino	15,815	4,064 00
San Diego	77,231	62,750 00
San Francisco	10,258	4,610 00
San Mateo	200	160 00
Santa Barbara	600	250 00
Santa Clara	87,498	43,188 00
Siskiyou	52,633	6,580 00
Sonoma	38,109	7,905 00
Yuba	47,555	9,318 00
Totals	2,083,326	\$501,834 00

## Total Figures.

(These figures are comparable with the sum of the macadam and rubble output as published in past years.)

County.	Amount, tons.	Value.
Alameda	952,805	\$404,615 00
Butte	231,338	78,208 00
Colusa	67,368	16,702 00
Contra Costa	455,814	257,503 00
El Dorado	7,284	5,465 00
Fresno	439,703	280,911 00
Glenn	421,775	51,430 00
Humboldt	34,743	37,756 00
Inyo	46,450	32,555 00
Kern	230,950	107,880 00
Los Angeles	878,422	536,876 00
Madera	1,300	800 00
Marin	173,646	108,786 00
Merced	106,750	49,548 00
Monterey	35,117	27,011 00
Napa	238,732	127,428 00
Orange	7,560	855 00
Placer	24,468	7,930 00
Riverside	510,888	453,724 00
Sacramento	370,556	131,037 00
San Benito	250,322	107,558 00
San Bernardino	154,841	166,808 00
San Diego	191,004	195,835 00
San Francisco	145,050	119,636 00
San Mateo	66,568	61,185 00
Santa Barbara	3,738	6,602 00
Santa Clara	116,875	62,595 00
Santa Cruz	7,627	7,627 00
Siskiyou	52,633	6,580 00
Solano	159,049	127,589 00
Sonoma	55,292	21,252 00
Ventura	1,000	750 00
Yuba	47,555	9,318 00
Totals	6,487,223	\$3,610,357 00

**Feldspar.**

The feldspars occur as constituents of nearly all rocks. The feldspar of commerce, however, is all obtained from pegmatites, where the crystals are large enough to admit of more or less sorting. The better grades of feldspar are used in pottery manufacture and in the making of various enamel wares. Where a high per cent of impurities is present the material is ground coarsely and used in the manufacture of "ready roofing," "chicken grit," etc. Small quantities are used in glass making, and as an abrasive in scouring soap. Attempts have been made to prove the value of the potash feldspars as fertilizer.

Feldspar was first produced commercially in California in 1910. During 1911, 740 tons were quarried and sold, the crude material at the property having a value of \$4,560, or an average of a little more than \$6 per ton.

**Fuller's earth.**

Fuller's earth, so named from its earliest use in fulling wool, is a rather rare, soft, friable rock whose value depends altogether on its texture and its filtering and absorbent properties. It has no definite composition, mineralogically, its physical properties rather than a chemical analysis determining its commercial value. Fuller's earth was first produced in the United States in the early nineties, and has been mined and marketed in a small way in California annually since 1899. During 1911 the output amounted to 466 tons valued at \$5,294, an average spot value of \$11.36 per ton.

*Reference:* Bull. 38, p. 273.

**Gems.**

The following named gems are among those commonly produced in California: Agate, amazonstone, almandine, beach stones of many kinds, benitoite, bloodstone, chalcedony, californite, chrysoprase, datolite, diamond, fossil coral, garnet, hyacinth, hiddenite, jasper, kunzite, moonstone, rose, smoky and gold quartz, rhodolite, rhodonite, rock crystal, spodumene, sunstone, topaz, tourmaline, turquoise, turquoise-matrix, and many other stones with trade names.

The following counties reported production of one or more of the above: Butte, Fresno, Inyo, Los Angeles, Riverside, San Diego, Siskiyou, and Tulare.

New deposits of gems are continually being discovered. The value of the stones in the rough is extremely problematical, and the demand is more unsteady than for the "precious" stones, hence spot values of the crude material are difficult to arrive at. The figures here given are the result of (1) correspondence with producers, and (2) obtaining estimates from dealers and others who are actively engaged in the business, and the result is the closest approximation that can be deduced. There

was an overproduction of gems in 1910 and as a result the 1911 output is somewhat below normal.

A large number of beach stones of every description were utilized as gems in Los Angeles County during the year. This branch of the industry did not show a decrease, the local demand in Los Angeles City and the surrounding beach towns being quite strong.

Small diamonds of good quality continue to be occasionally found in Butte County, and development work along these lines is to be vigorously pushed in the near future, according to parties interested.

Rhodonite and californite exist in considerable amount in Fresno County although the output was very small during the past year.

Several discoveries were made in Inyo County in 1911. The actual output was almost nothing but the outlook is for an increase in this branch of the mineral industry in the near future as the stones are of the highest quality.

Gem mines of as yet undetermined value are located in San Benito County, and various deposits in Riverside County are likely to become large producers with further development. San Bernardino produced no gems during the year 1911 although two especially well equipped companies are doing preliminary work and expect to place their output on the market before the end of 1912.

San Diego County contains more gem deposits, developed and undeveloped, than any other section of the State. Its annual output has been estimated to be as high as \$100,000. The value of the cut stones would doubtless reach that figure, although an investigation of conditions there has proved that the overproduction of 1910 is still affecting the industry—almost a year and a half later—both as concerns production and price, and one quarter of the above figure represents a fair average estimate of the value of the crude gem material mined in the county during 1911.

In Siskiyou and Tulare counties the same general conditions prevail, and at present there is no doubt but that demand and prices offered are not keeping pace with possible production.

Following is a summary of the gem industry for 1911 tabulated by counties:

County.	Value.
Butte -----	\$150 00
Fresno -----	250 00
Inyo -----	174 00
Los Angeles -----	5,000 00
Riverside -----	250 00
San Diego -----	25,000 00
Siskiyou -----	1,000 00
Tulare -----	20,000 00
Total -----	\$51,824 00

**Gold.**

The following tabulation shows gold production in California, by county, as compiled by the U. S. Geological Survey. For complete information see Mineral Resources for 1911, U. S. G. S.:

County.	Value.
Amador -----	\$2,832,395 00
Butte -----	2,323,396 00
Calaveras -----	1,112,315 00
Colusa -----	12,837 00
Del Norte -----	1,743 00
El Dorado -----	133,967 00
Fresno -----	17,441 00
Humboldt -----	34,966 00
Imperial -----	97,855 00
Inyo -----	574,945 00
Kern -----	557,471 00
Madera -----	1,958 00
Mariposa -----	172,532 00
Modoc -----	19,875 00
Mono -----	261,232 00
Nevada -----	2,199,147 00
Placer -----	251,298 00
Plumas -----	228,785 00
Riverside -----	20,623 00
Sacramento -----	1,812,826 00
San Bernardino -----	127,367 00
Shasta -----	1,059,881 00
Sierra -----	461,513 00
Siskiyou -----	422,297 00
Stanislaus -----	307,538 00
Trinity -----	612,149 00
Tuolumne -----	1,093,484 00
Yuba -----	2,997,072 00
<b>Total -----</b>	<b>\$19,738,908 00</b>

<sup>1</sup>Includes Lassen County production.

<sup>2</sup>Includes San Diego County production.

<sup>3</sup>Includes Los Angeles County production.

<sup>4</sup>Dredge production included in Stanislaus total.

<sup>5</sup>Includes Merced County production as well as dredge production from Shasta and Trinity.

<sup>6</sup>Dredge production included in Stanislaus total.

**Granite.**

Granite, used as a building stone as well as for monumental and other purposes, was produced in California during 1911 to the amount of 401,209 cubic feet and value of \$344,351, crude stone at the property. Stone used for curbing is hereby listed separately, the total value, including curbing, being \$355,742.

California granite has no superior in the world. The past few years has seen some of the most beautiful and classical buildings in the world constructed in this State from California granite. Among these are several banking buildings and the Postoffice and Customs House in San Francisco, also several very beautiful buildings on the campus of the University of California. This granite is obtained from quarries in a number of counties, among which there seems little choice, as to superiority.

The following table shows the summary of this branch of the Mineral Industry in California for 1911, as reported by the various producing counties:

**Granite.**

County.	Amount, cu. ft.	Value.
Fresno -----	37,500	\$38,000 00
Los Angeles -----	14,000	16,200 00
Madera -----	99,900	74,190 00
Nevada -----	1,250	3,500 00
Placer -----	190,634	199,599 00
Riverside -----	12,295	10,555 00
Sacramento -----	45,630	12,307 00
Totals -----	401,209	\$344,351 00

<sup>1</sup>Low value due to prison labor.

**Curbing.**

Placer -----	47,395	\$9,202 00
	Lin. ft.	
Riverside -----	3,000	1,800 00
Sonoma -----	3,700	389 00
Totals -----	54,095	\$11,391 00

**Graphite.**

No natural graphite was produced in California during 1911 although there are deposits of the mineral located in several counties in the State, and the owners of one property reported development work having been done in the course of the year with a possible output for 1912. Graphite deposits have been discovered, and exploited to some extent, in the following counties: Fresno, Los Angeles, Mendocino, San Bernardino, Siskiyou, Sonoma, and Tuolumne.

The demand for graphite shows a steady increase. Imports, largely from Mexico and Ceylon, amount to about \$2,000,000 annually. On account of its infusibility and resistance to action of molten metals, graphite is very valuable in the manufacture of crucibles; it is also largely used in the manufacture of electrical appliances, as a steam packing, as a lubricant, in manufacture of paint and lead pencils, and in many other ways. Prices obtainable vary widely, depending upon the grade of the product, and upon its being amorphous or crystalline. The lowest grades bring about \$10 per ton, and from this figure prices range up as high as \$200 for the pure crystalline variety.

A few years ago only crystalline graphite of superior quality could be used in many of the arts and manufactures. Now inferior mineral may be concentrated by flotation, but the discovery that a fair grade of graphite could be manufactured from a good grade of coal has seriously hurt the mining of graphite, and lowered the price so that inferior mineral scarcely finds a sale, or can be concentrated at a profit.

**Gypsum.**

Gypsum occurs in Butte, Colusa, Fresno, Kern, Kings, Los Angeles, Monterey, Orange, Riverside, San Benito, San Bernardino, San Luis Obispo, Santa Barbara, Tulare, and Ventura counties. Production for 1911 was reported from only four counties, as follows:

County.	Amount, tons.	Value.
Kern -----	853	\$4,245 00
Kings -----	20	100 00
Monterey -----	10,000	30,625 00
San Bernardino -----	20,584	66,505 00
Totals -----	31,457	101,475 00

This shows a decrease from 1910 when the production amounted to 45,294 tons valued at \$129,152. Among the uses of gypsum are: plaster of paris, as a wall plaster, as a fertilizer, and in the paper and glass industries.

*Reference:* Bull. 38, California State Mining Bureau, p. 281.

**Infusorial earth.**

Infusorial earth, also known as diatomaceous earth, tripoli and tripolite, occurs in California very extensively. Deposits of importance are located in Los Angeles, Monterey, Orange, San Benito, San Bernardino, San Luis Obispo, Santa Barbara, Shasta, and Tehama counties.

The production for 1911 amounted to 2,194 tons valued at \$19,670 as compared with 1,843 tons valued at \$17,617 quarried and sold during the previous year. Only two counties contributed to the total:

County.	Amount, tons.	Value.
Monterey -----	850	\$5,950 00
Santa Barbara -----	1,344	13,720 00
Totals -----	2,194	\$19,670 00

Infusorial earth is not soluble in acids, is very light, and extremely porous. It is used as an absorbent, is a first class non-conductor of heat, is utilized in the manufacture of refractory brick, as a polishing powder, in scouring soaps, etc.

*Reference:* Bull. 38, p. 289, California State Mining Bureau.

**Iron ore.**

Iron deposits of great extent are known to exist in thirty-one different counties of the State. For various economic reasons the iron industry has made little progress to date. The future possibilities along these lines are very great. Actual production of iron ore in 1911 amounted to 558 tons valued at \$558, compared with 570 tons in 1910, valued at \$900.

**Lead.**

Nine counties in California reported lead production for the year 1911 to the amount of 1,403,839 pounds valued at \$63,173, this being a decrease of 1,612,161 pounds in amount and \$70,909 in value as compared with the previous year when the output was 3,016,000 pounds valued at \$134,082.

Tabulated county returns are as follows:

County.	Amount, pounds.	Value.
Calaveras -----	220	\$10 00
El Dorado -----	3,701	167 00
Inyo -----	1,182,122	53,195 00
Kern -----	2,417	109 00
Mono -----	37,000	1,665 00
Nevada -----	14,831	667 00
Plumas -----	1,329	60 00
San Bernardino -----	161,338	7,260 00
Shasta -----	881	40 00
Totals -----	1,403,839	\$63,173 00

**Lime and limestone.**

Fourteen counties in the State reported a production of lime or limestone, or both, for the year 1911. Several kilns were closed, during the year, for one reason or another. The average price of lime per barrel was seven per cent lower than during the previous year. Limestone production also decreased in amount and value, owing in part to the curtailment of the copper industry and the consequent lessened demand for limestone as flux. A considerable tonnage of limestone was used in road building during the year, and has been classified as macadam. This fact makes a possible apparent decrease.

The total lime production was 429,587 barrels, valued at \$390,988 as compared with an output of 479,507 barrels valued at \$477,683 in 1910. Limestone to the amount of 516,398 tons was quarried and used as such, and had a spot value of \$452,790 as compared with 684,635 tons valued at \$581,208 for the previous year.

Lime and limestone production, by counties, is shown below:

**Lime.**

County.	Amount, barrels.	Value.
Amador -----	1,200	\$1,500 00
Contra Costa -----	11,872	8,645 00
El Dorado -----	15,086	12,309 00
Kern -----	96,500	82,025 00
Santa Cruz -----	216,508	206,225 00
Shasta -----	13,271	10,164 00
Siskiyou -----	150	120 00
Tuolumne -----	75,000	70,000 00
Totals -----	429,587	\$390,988 00

# 91

## Limestone.

County.	Amount, tons.	Value.
Calaveras -----	3,943	\$11,733 00
Contra Costa -----	68,708	46,208 00
El Dorado -----	1,000	1,000 00
Kern -----	600	400 00
Monterey -----	2,000	6,000 00
San Bernardino -----	245,102	177,080 00
San Mateo -----	93,500	74,800 00
Santa Barbara -----	4,239	8,174 00
Santa Clara -----	2,417	3,918 00
Santa Cruz -----	22,622	44,591 00
Shasta -----	67,924	65,253 00
Siskiyou -----	24	24 00
Tuolumne -----	4,319	13,609 00
Totals -----	516,398	\$452,790 00

## Magnesite.

Occurrences of magnesite are known in Alameda, Fresno, Mendocino, Napa, Placer, San Benito, Santa Clara, Riverside, Stanislaus, Sonoma, Tulare, and other counties in California.

Magnesite is used in the manufacture of paper, in making refractory brick and what is known as magnesite flooring, and in the manufacture of carbon dioxide, principally. California is the only State in the Union that produces this mineral.

Production for 1911 by counties is as follows:

County.	Amount, tons.	Value.
Fresno -----	220	\$2,195 00
Placer -----	300	3,300 00
Riverside -----	575	4,600 00
Tulare -----	7,763	57,335 00
Totals -----	8,858	\$67,430 00

## Manganese.

Manganese is found in the following counties of this State: Alameda, Colusa, Merced, Placer, Plumas, Riverside, San Benito, San Joaquin, San Luis Obispo, Santa Clara, and Sonoma.

Production has been reported in the State almost continuously for the past twenty-five years amounting to 9,254 tons valued at \$87,910 for the quarter century. The great bulk of this output is credited to the first half of that period. Since 1903 the production has been nominal. In 1911 two tons with a spot value of \$40 represent the average for several years.

## Marble.

Only three counties reported a production of marble during 1911 although large deposits of the finest marble exist very extensively throughout the State, and will most certainly in time take the place of the eastern and foreign stone, which is annually used for building and ornamental purposes.

Production for 1911 amounted to 20,201 cubic feet, valued at \$54,103 as compared with 18,960 cubic feet worth \$50,200 in 1910.

Output by counties:

County.	Amount, cu. ft.	Value.
Los Angeles -----	1,100	\$3,300 00
San Bernardino -----	135	405 00
Tuolumne -----	18,966	50,398 00
Totals -----	20,201	\$54,103 00

#### Mineral paint.

Butte, Calaveras, Los Angeles, Napa, Nevada, Placer, Riverside, Siskiyou, Sonoma, Stanislaus, Trinity, and Yuba counties contain extensive deposits of mineral paint. The first production of this material reported in California was in 1890. Since that date there has been an annual output of from 100 to 600 tons roughly.

For 1911 a total of 186 tons valued at \$1,184 was produced in Placer and Stanislaus counties, very nearly an equal amount in each.

#### Mineral water.

California is rich in her possession of mineral springs of every kind. Figures published in this report are for mineral water actually bottled and sold. Millions of gallons are otherwise utilized, or annually run to waste, of which no reliable data can be compiled. There is a great variance in prices obtained because of the great difference in the constituent ingredients of the several waters, and in the consequent demand for same.

Returns from the producers show the amount of mineral water marketed in 1911 to have been 2,637,669 gallons, valued at \$590,654, as compared with 2,335,259 gallons worth \$522,009 in 1910, an increase of 302,410 gallons, in amount, and \$68,645 in value.

Production tabulated by county is as follows:

County.	Amount, gallons.	Value.
Calaveras -----	10,000	\$5,000 00
Colusa -----	136,300	68,150 00
Contra Costa -----	206,500	10,325 00
Lake -----	227,440	58,993 00
Los Angeles -----	229,019	17,256 00
Marin -----	328,740	36,500 00
Napa -----	141,540	86,530 00
Riverside -----	90,580	11,500 00
San Benito -----	3,600	1,540 00
San Diego -----	60,090	87,020 00
San Luis Obispo -----	2,000	1,000 00
Santa Barbara -----	73,640	15,900 00
Santa Clara -----	165,720	10,000 00
Shasta -----	25,000	6,250 00
Siskiyou -----	700,000	120,000 00
Solano -----	30,000	4,000 00
Sonoma -----	202,500	50,250 00
Tehama -----	5,000	500 00
Totals -----	2,637,669	\$590,654 00

**Natural gas.**

As in the case of mineral water, untold quantities of natural gas are annually wasted. Definite figures as to amount actually utilized are difficult to arrive at as in many cases the owners of gas wells make no attempt to measure the output, and even the value of the product which is used becomes a matter of estimate. This does not hold in all cases, but it is true to such an extent as to make an estimate of amount valueless. Active steps are now being taken to conserve the vast supply of natural gas in the State and the near future will show an enormous increase in value of this branch of the mineral industry.

Natural gas, used for fuel in the oil fields, for lighting and for all other purposes in California during 1911 had a value of \$491,859 as compared with the 1910 consumption worth \$476,697 (the latter figure taken from "Mineral Resources of the United States" 1910, Part II, page 323, U. S. Geological Survey).

The total for 1911 by counties is as follows:

County.	Value.
Humboldt -----	\$150 00
Kern -----	165,438 00
Kings -----	800 00
Los Angeles -----	15,208 00
Sacramento -----	83,890 00
San Joaquin -----	114,433 00
Santa Barbara -----	100,386 00
Solano -----	8,596 00
Ventura -----	2,958 00
Total -----	\$491,859 00

**Onyx and travertine.**

Onyx and travertine marble were produced in California to the value of \$91,400 between the years 1887 and 1896. During the past fifteen years there has been no production of this kind of building stone in the State, although many partially exploited deposits exist in a score of counties. Practically all the onyx and travertine now used on the coast are imported from Mexico.

**Paving blocks.**

Six counties reported production of paving blocks for 1911 to the amount of 4,141 M; spot value, \$210,819. This is a slight decrease in amount and an increase in value over the 1910 production, which equaled 4,434 M in number with a value of \$198,916. Paving blocks are mostly made from granite or andesite, the latter variety being known to the trade as "basalt blocks." Solano and Sonoma are the largest producers of this class of blocks.

The following tabulation shows the output by counties as reported to the State Mining Bureau:

County.	Amount, M.	Value.
Placer -----	60	\$2,220 00
Riverside -----	126	7,939 00
San Bernardino -----	305	19,930 00
San Diego -----	109	5,653 00
Solano -----	263	12,685 00
Sonoma -----	3,278	162,392 00
Totals -----	4,141	\$210,819 00

#### Petroleum.

The State Mining Bureau has in press a bulletin, No. 63, which deals largely with the petroleum industry in the fields south of Tehachapi.

County production during 1911 is as follows:

County.	Amount, barrels.	Value.
Fresno -----	18,249,611	\$8,744,085 00
Kern -----	1,250,000	<sup>1</sup> 600,000 00
Los Angeles -----	43,569,225	18,920,658 00
Orange -----	2,993,600	<sup>1</sup> 1,287,248 00
San Luis Obispo -----	4,549,288	3,062,722 00
Santa Barbara -----	375,000	<sup>1</sup> 251,250 00
Santa Clara -----	5,927,275	3,830,460 00
Ventura -----	418,000	<sup>1</sup> 267,520 00
Totals -----	38,092	25,146 00
	6,335,156	3,002,147 00
	431,000	<sup>1</sup> 202,570 00
	12,828	8,505 00
	466,682	327,097 00
	32,400	<sup>1</sup> 22,680 00
Totals -----	84,648,157	\$40,552,088 00

<sup>1</sup>Used as fuel in the field. Value figured at the average price obtained in the county during the year.

#### Platinum.

Platinum production in California during the year 1911 amounted to 511 Troy ounces, valued at \$14,873, as compared to 337 ounces worth \$8,386 in 1910. Platinum yield in the State is largely due to its incidental recovery along with placer gold in various dredging and hydraulic fields.

#### Pyrite.

Pyrite production in California for 1911 amounted to 54,225 tons, valued at \$182,954, as compared with 42,621 tons worth \$179,862 during 1910. These figures include only pyrite actually used in the manufacture of sulphuric acid. Many thousand tons of pyritic ores are annually treated in the State in which the sulphur content is not utilized, the fumes passing out into the air. Strenuous efforts are being made, however, to render these noxious fumes harmless to the vegetation of the surrounding regions.

Output by counties is as follows:

County.	Amount, tons.	Value.
✓ Alameda -----	6,340	\$31,352 00
✓ Shasta -----	47,885	151,602 00
Totals -----	54,225	\$182,954 00

#### Quicksilver.

Contrary to predictions generally made at the end of the year the quicksilver output for 1911 showed a considerable increase over that of 1910. The production for 1911 was 19,109 flasks valued at \$879,205, in flasks of 75 pounds at \$46.01 per flask, which was the average price received in the San Francisco market during the year. This is an increase in quantity of 1,444 flasks, and in value, of \$80,203 over the production of 1910.

The largest output came from San Benito County, followed by Santa Clara, Lake, San Luis Obispo, Napa, Sonoma, Santa Barbara, Trinity, and Colusa counties in the order named.

The following counties also contain quicksilver deposits, some of which promise to become producers at an early date: Kings, Monterey, El Dorado, Fresno, Shasta, Solano, Stanislaus, and Yolo. Unusual activity has been apparent among operators and owners of quicksilver mines during 1911 and the outlook for a further increase in the future is favorable.

The 1911 quicksilver production has not been exceeded since 1905 when the product was sold for \$886,081. The value for succeeding years is as follows:

Year.	Value.
1906 -----	\$712,334 00
1907 -----	663,178 00
1908 -----	763,520 00
1909 -----	773,788 00
1910 -----	799,002 00
1911 -----	879,205 00

One of the most important factors in the increased output of quicksilver is the advance in the price of the metal. The lowering of the cost of production has also made it possible to profitably treat a decreasingly lower grade of ore, so that now, a quicksilver property with a good-sized vein of ore containing only one half of one per cent of mercury will pay expenses, and under the most favorable circumstances may yield a profit. Quicksilver is produced in Texas and also is known to occur in several other Western States, but California is the greatest producer in America. Notwithstanding this, the mines of Europe control the market and fix the price.

Quicksilver production for the year, tabulated by counties is as follows:

County.	Amount, flasks.	Value.
Colusa -----	5	\$230 00
Lake -----	899	41,363 00
Napa -----	140	6,441 00
San Benito -----	9,775	449,748 00
San Luis Obispo -----	569	26,180 00
Santa Barbara -----	50	2,301 00
Santa Clara -----	7,533	346,593 00
Sonoma -----	94	4,325 00
Trinity -----	44	2,024 00
Totals -----	19,109	\$879,205 00

#### Salt.

The California salt output comes from two sources; from the waters of the Pacific Ocean by evaporation, this branch of the industry being carried on principally on the shores of San Francisco Bay, as well as at Long Beach and San Diego; and in the second case from the old lake beds in the desert portions of the State, where many thousand acres of saline deposits exist. South of Danby, in San Bernardino County, is a large bed of rock salt that has been mined quite extensively at various periods for many years past.

During 1911 six counties reported a production of 173,332 tons of crude salt valued at \$324,255, or an average of \$1.87 a ton, spot value. As compared with the 1910 figures, when 174,920 tons were produced, worth \$395,417, the output is seen to be practically unchanged although the price received suffered a decrease of \$.41 per ton.

#### Output Tabulated by Counties.

County.	Amount, tons.	Value.
Alameda -----	121,540	\$201,542 00
Los Angeles -----	7,592	16,113 00
San Bernardino -----	3,600	13,800 00
San Diego -----	13,000	37,500 00
San Mateo -----	27,500	55,000 00
Solano -----	100	300 00
Totals -----	173,332	\$324,255 00

#### Sand—Glass.

Both glass sand and quartz sand are produced in small quantities in California, possible production being far greater than any yet actually attained. During 1911 no output of "Quartz Sand" was reported, glass sand, however, being produced to the amount of 8,620 tons, valued at \$8,672—amount and value being practically the same as for the preceding year.

**Sandstone.**

Sandstone quarries are located in twenty-two counties of the State. Production for 1911 was reported from only five of these counties, however. The year's production amounted to 255,313 cubic feet, having a value of \$127,314 at the quarry. In 1910 only 165,971 cubic feet were quarried, valued at \$80,443. The following table shows the output by counties:

County.	Amount, cu. ft.	Value.
Amador -----	90,000	\$45,000 00
Colusa -----	101,029	50,027 00
Santa Barbara -----	58,976	29,507 00
Siskiyou -----	650	455 00
Ventura -----	4,658	2,325 00
Totals -----	255,313	\$127,314 00

**Silver.**

The following table shows silver production in California for 1911 by counties, as tabulated by the U. S. Geological Survey. For complete information see Mineral Resources for 1911, U. S. G. S. The average price received for silver for the year was 53 cents per ounce:

County.	Value.
Amador -----	\$28,899 00
Butte -----	5,102 00
Calaveras -----	67,032 00
Colusa -----	281 00
Del Norte -----	7 00
El Dorado -----	1,010 00
Fresno -----	81 00
Humboldt -----	169 00
Imperial -----	2189 00
Inyo -----	45,678 00
Kern -----	5,833 00
Madera -----	77 00
Mariposa -----	1,390 00
Modoc -----	363 00
Mono -----	35,508 00
Nevada -----	15,691 00
Placer -----	2,585 00
Plumas -----	1,125 00
Riverside -----	2,121 00
Sacramento -----	3,047 00
San Bernardino -----	35,542 00
Shasta -----	386,991 00
Sierra -----	5,604 00
Siskiyou -----	2,561 00
Stanislaus -----	1,131 00
Trinity -----	6,777 00
Tuolumne -----	13,243 00
Yuba -----	5,299 00
Total -----	\$673,336 00

<sup>1</sup>Includes Lassen County production.

<sup>2</sup>Includes San Diego County production.

<sup>3</sup>Includes Los Angeles County production.

<sup>4</sup>Dredge production included in Stanislaus total.

<sup>5</sup>Includes Merced County production as well as dredge production from Shasta and Trinity counties.

<sup>6</sup>Dredge production included in Stanislaus total.

### Soda.

Deposits of soda are located in various parts of southern California, more especially in Inyo, San Bernardino, and San Luis Obispo counties. The 1911 production amounted to 9,023 tons, valued at \$52,887, as compared with an output of 8,125 tons worth \$11,862 in 1910.

### Tungsten.

The value of tungsten produced in California in 1911 amounted to \$127,706 as compared to \$208,245 in 1910. Tungsten is used largely in the steel industry. The ores are sold per unit of tungstic trioxide, ores of a lower grade than 45 per cent  $WO_3$  are not generally marketable.

### Zinc.

A small quantity of zinc was produced in the State during the years 1906, 1907, 1908 having a total value of \$26,708. With that exception 1911 shows the first returns from what bids fair to become a large industry. Deposits of zinc ore exist in Inyo, Orange, San Bernardino, and Shasta counties. Zinc occurs to some extent in the ores of many other counties although as yet they have not come to be considered zinc ore. The output for 1911 was 2,679,842 pounds, valued at \$152,751.

In addition to the foregoing minerals eight others have been produced in the State at different times, any and all of which may become a factor in the mineral output of California, to wit: Lithia mica, mica, quartz crystals, serpentine, slate, soapstone, sulphur and tin.

From 1899 to 1905 lithia mica was produced to the total value of \$127,556, the output coming almost entirely from San Diego County. The mineral was used as a source of lithia, which in the form of the carbonate is used in the manufacture of effervescing lithia tablets, and in the preparation of mineral waters, and in the form of the nitrate in the making of the "red fire" of pyrotechnics.

In 1902, 1903, and 1904 mica production to the total amount of 150 tons valued at \$9,300 was reported to the State Mining Bureau.

At various times during the past fifteen years small amounts of quartz crystals have been marketed in the State. The total value recorded being \$57,468. No commercial production has been reported during the past three years.

Serpentine has been quarried both as a building and as an ornamental stone in various parts of California during the past twenty years. In most cases, however, it lacks sufficient brightness of color to be desirable for ornamental purposes, and has too many cracks and impurities to make a first-class building stone. The value of all the serpentine produced in the State amounts to only \$33,259. Production was last reported in 1907.

Slate production in California had its beginning in 1889 and has been continuous, in greater or less amount, up to 1911, when no production

was reported. The output has been rapidly declining in recent years. Many large deposits of slate are known in the State, but its greatest use in the past has been as a fireproof roofing, and the various brands of "Ready Roofing" which have been placed on the market in recent years have hurt the industry seriously.

Soapstone deposits of great extent are located in various parts of the State although none of them have been developed to any extent. The first reported production was in 1893. Intermittently since that time up to and including the year 1910, soapstone to the value of \$41,559 has been placed on the market. During 1911 no output was reported to this Bureau.

In several localities it is possible to distill sulphur from the rocks which are found in limited areas. In the northern portion of the State are also known springs which deposit sulphur from solution. In 1898 a production of two tons of sulphur, valued at \$50, was reported. No other output of sulphur has been recorded to date. In the vicinity of Lassen Peaks are several fumeroles where sulphur is being constantly deposited from vents. One of these is known as Supan's Springs, and is situated about five miles north of Morgan station; another is called Hot Spring Valley, and is on a tributary of Warner Creek. Here are scores of vents where sulphur is being deposited. A third locality is called Bumpass' Hell. This latter is close to the base of the main peak on its southern side. In each of these localities sulphur occurs, but in each instance it is mixed with much earthy matter which reduces its value materially. It is not likely that any of these deposits have a present value owing to the lack of cheap transportation facilities.

Tin was produced in California in 1891 and 1892 to the value of \$59,964. No other production is known in the history of the State. The deposits of tin ore are in Riverside County, seven miles east of Corona.

It may not be generally known, but petroleum was produced in a small way in California very early in the history of the country, in fact, long before it was invaded by the army of gold seekers. Mr. C. Morrell, a druggist in San Francisco, is commonly credited with being the first to attempt the distillation of kerosene from crude petroleum. This was in 1857, but several years prior to that Andreas Pico made illuminating oil from petroleum which he obtained in the Newhall region in Los Angeles County. This oil was burned, so it is said, in lamps in the Mission San Fernando. There is no doubt whatever that the Spanish padres who built the missions in California in the latter part of the eighteenth century, were aware of the existence of petroleum here and made use of the brea, as the seepages are called.

## OUTPUT BY COUNTIES.

## ALAMEDA COUNTY.

Mineral.	Quantity.	Value.
Brick .....	19,660 M	\$153,330 00
Chrome .....	60 tons	500 00
Clay .....	10,500 tons	8,300 00
Crushed rock <sup>1</sup> .....	952,805 tons	404,615 00
Pyrnite .....	6,340 tons	31,352 00
Salt .....	121,540 tons	201,542 00
Total .....		\$799,639 00

<sup>1</sup>Includes macadam, rubble, trap, riprap, sand and gravel.

## AMADOR COUNTY.

Mineral.	Quantity.	Value.
Brick .....	2,000 M	\$20,000 00
Clay .....	43,352 tons	37,395 00
Copper .....	227,848 lbs.	28,481 00
Gold .....		2,832,395 00
Lime .....	1,200 bbls.	1,500 00
Sandstone .....	90,000 cu. ft.	45,000 00
Silver .....		28,899 00
Total .....		\$2,993,670 00

## BUTTE COUNTY.

Mineral.	Quantity.	Value.
Crushed rock <sup>1</sup> .....	231,338 tons	\$78,208 00
Gems .....		150 00
Gold .....		2,323,396 00
Silver .....		5,102 00
Total .....		\$2,406,856 00

<sup>1</sup>Sand and gravel.

## CALAVERAS COUNTY.

Mineral.	Quantity.	Value.
Clay .....	50 tons	\$200 00
Copper .....	6,190,153 lbs.	773,769 00
Gold .....		1,112,315 00
Lead .....	220 lbs.	10 00
Limestone .....	3,943 tons	11,733 00
Mineral water .....	10,000 gals.	5,000 00
Silver .....		67,032 00
Total .....		\$1,970,059 00

## COLUSA COUNTY.

Mineral.	Quantity.	Value.
Crushed rock <sup>1</sup> -----	67,368 tons	\$16,702 00
Gold <sup>2</sup> -----		2,837 00
Mineral water -----	136,300 gals.	68,150 00
Quicksilver -----	5 flasks	230 00
Sandstone -----	101,029 cu. ft.	50,027 00
Silver <sup>2</sup> -----		281 00
Total -----		\$138,227 00

<sup>1</sup>Rubble, sand, gravel.<sup>2</sup>Including Lassen County production.

## CONTRA COSTA COUNTY.

Mineral.	Quantity.	Value.
Brick -----	36,463 M	\$271,575 00
Crushed rock <sup>1</sup> -----	455,814 tons	257,503 00
Lime -----	11,872 bbls.	8,645 00
Limestone -----	68,708 tons	46,208 00
Mineral water -----	206,500 gals.	10,325 00
Total -----		\$594,256 00

<sup>1</sup>Macadam, rubble, sand and gravel.

## DEL NORTE COUNTY.

Mineral.	Value.
Gold -----	\$1,743 00
Silver -----	7 00
Total -----	\$1,750 00

## EL DORADO COUNTY.

Mineral.	Quantity.	Value.
Crushed rock -----	7,284 tons	\$5,465 00
Gold -----		133,967 00
Lead -----	3,701 lbs.	167 00
Lime -----	15,086 bbls.	12,309 00
Limestone -----	1,000 tons	1,000 00
Silver -----		1,010 00
Total -----		\$153,918 00

## FRESNO COUNTY.

Mineral.	Quantity.	Value.
Brick -----	4,500 M	\$28,500 00
Crushed rock <sup>1</sup> -----	439,703 tons	280,911 00
Gems -----		250 00
Gold -----		17,441 00
Granite -----	37,500 cu. ft.	38,000 00
Magnesite -----	220 tons	2,195 00
Petroleum <sup>2</sup> -----	19,499,611 bbls.	9,344,085 00
Silver -----		81 00
Total -----		\$9,711,463 00

<sup>1</sup>Macadam, rubble, sand and gravel.<sup>2</sup>Includes 1,250,000 barrels valued at \$600,000, used as fuel in the field.

## GLENN COUNTY.

Mineral.	Quantity.	Value.
Crushed rock (sand and gravel) -----	421,775 tons	\$51,430 00
Total -----		\$51,430 00

## HUMBOLDT COUNTY.

Mineral.	Quantity.	Value.
Brick -----	357 M	\$2,880 00
Clay -----	937 tons	937 00
Crushed rock -----	34,743 tons	37,756 00
Gold -----		34,966 00
Natural gas -----		150 00
Silver -----		169 00
Total -----		\$76,858 00

## IMPERIAL COUNTY.

Mineral.	Quantity.	Value.
Brick -----	1,200 M	\$7,000 00
Gold <sup>1</sup> -----		97,855 00
Silver <sup>1</sup> -----		189 00
Total -----		\$105,044 00

<sup>1</sup>Includes San Diego County production.

## INYO COUNTY.

Mineral.	Quantity.	Value.
Crushed rock -----	46,450 tons	\$32,555 00
Copper -----	27,889 lbs.	3,486 00
Gems -----		174 00
Gold -----		574,945 00
Lead -----	1,182,122 lbs.	53,195 00
Silver -----		45,678 00
Total -----		\$710,033 00

## KERN COUNTY.

Mineral.	Quantity.	Value.
Brick -----	5,603 M	\$41,426 00
Clay -----	242 tons	121 00
Copper -----	29,441 lbs.	3,680 00
Crushed rock <sup>1</sup> -----	230,950 tons	107,880 00
Gold -----		557,471 00
Gypsum -----	853 tons	4,245 00
Lead -----	2,417 lbs.	109 00
Lime -----	96,500 bbls.	82,025 00
Limestone -----	600 tons	400 00
Natural gas -----		165,438 00
Petroleum <sup>2</sup> -----	46,562,825 bbls.	20,207,906 00
Silver -----		5,833 00
Total -----		\$21,176,534 00

<sup>1</sup>Macadam, rubble, sand and gravel.<sup>2</sup>Includes 2,993,600 barrels, valued at \$1,287,248, used as fuel in field.

## KINGS COUNTY.

Mineral.	Quantity.	Value.
Gypsum -----	20 tons	\$100 00
Natural gas -----		800 00
Total -----		\$900 00

## LAKE COUNTY.

Mineral.	Quantity.	Value.
Mineral water -----	227,440 gals.	\$58,933 00
Quicksilver -----	899 flasks	41,363 00
Total -----		\$100,296 00

## LASSEN COUNTY.

Gold and silver the only mineral production reported by Lassen County for 1911. Value included with Colusa County total by the U. S. Geological Survey

## LOS ANGELES COUNTY.

Mineral.	Quantity.	Value.
Brick -----	160,259 M	\$1,442,913 00
Clay -----	15,650 tons	41,025 00
Crushed rock -----	878,422 tons	536,876 00
Gems -----		5,000 00
Granite -----	14,000 cu. ft.	16,200 00
Marble -----	1,100 cu. ft.	3,300 00
Mineral water -----	229,019 gals.	17,256 00
Natural gas -----		15,208 00
Petroleum <sup>1</sup> -----	4,924,288 bbls.	3,313,972 00
Salt -----	7,592 tons	16,113 00
Total -----		\$5,407,863 00

<sup>1</sup>Includes 375,000 barrels, valued at \$251,250, used as fuel in field.

NOTE.—A small gold and silver production for 1911 is included in the Riverside County total of those minerals.

## MADERA COUNTY.

Mineral.	Quantity.	Value.
Brick -----	270 M	\$1,350 00
Copper -----	14,608 lbs.	1,826 00
Crushed rock -----	1,300 tons	800 00
Gold -----		1,958 00
Granite -----	99,900 cu. ft.	74,190 00
Silver -----		77 00
Total -----		\$80,201 00

## MARIN COUNTY.

Mineral.	Quantity.	Value.
Brick -----	19,695 M	\$87,445 00
Crushed rock -----	173,646 tons	108,786 00
Mineral water -----	328,740 gals.	36,500 00
Total -----		\$232,731 00

## MARIPOSA COUNTY.

Mineral.	Quantity.	Value.
Copper -----	14,641 lbs.	\$1,830 00
Gold -----		172,532 00
Silver -----		1,390 00
Total -----		\$175,752 00

## MENDOCINO COUNTY.

Mineral.	Quantity.	Value.
Brick -----	160 M	\$1,600 00
Total -----		\$1,600 00

## MERCED COUNTY.

Mineral.	Quantity.	Value.
Crushed rock -----	106,750 tons	\$49,548 00
Total -----		\$49,548 00

NOTE.—Gold and silver production included in Stanislaus County total for those minerals.

## MODOC COUNTY.

Mineral.	Value.
Gold -----	\$19,875 00
Silver -----	363 00
Total -----	\$20,238 00

## MONO COUNTY.

Mineral.	Quantity.	Value.
Gold -----		\$261,232 00
Lead -----	37,000 lbs.	1,665 00
Silver -----		35,508 00
Total -----		\$298,405 00

## MONTEREY COUNTY.

Mineral.	Quantity.	Value.
Crushed rock <sup>1</sup> -----	35,117 tons	\$27,011 00
Gypsum -----	10,000 tons	30,625 00
Infusorial earth -----	850 tons	5,950 00
Clay -----	1,100 tons	4,950 00
Limestone -----	2,000 tons	6,000 00
Total -----		\$74,536 00

<sup>1</sup>Macadam, sand and gravel.

## NAPA COUNTY.

Mineral.	Quantity.	Value.
Crushed rock <sup>1</sup> -----	238,732 tons	\$127,428 00
Mineral water -----	141,540 gals.	86,530 00
Quicksilver -----	140 flasks	6,441 00
Total -----		\$220,399 00

<sup>1</sup>Macadam, rubble, sand and gravel.

## NEVADA COUNTY.

Mineral.	Quantity.	Value.
Copper -----	1,665 lbs.	\$209 00
Gold -----		2,199,147 00
Granite -----	1,250 cu. ft.	3,500 00
Lead -----	14,831 lbs.	667 00
Silver -----		15,691 00
Total -----		\$2,219,214 00

## ORANGE COUNTY.

Mineral.	Quantity.	Value.
Brick -----	1,650 M	\$11,550 00
Crushed rock <sup>1</sup> -----	7,560 tons	855 00
Clay -----	2,000 tons	3,200 00
Petroleum <sup>2</sup> -----	6,345,275 bbls.	4,097,980 00
Total -----		\$4,113,585 00

<sup>1</sup>Macadam, sand and gravel.<sup>2</sup>Includes 418,000 barrels, valued at \$207,520, used as fuel in field.

## PLACER COUNTY.

Mineral.	Quantity.	Value.
Asbestos -----	125 tons	\$500 00
Brick -----	700 M	18,000 00
Clay -----	43,120 tons	29,200 00
Copper -----	118,624 lbs.	14,828 00
Crushed rock -----	24,468 tons	7,930 00
Curbing -----	47,395 lin. ft.	9,202 00
Gold -----		251,298 00
Granite -----	190,634 cu. ft.	199,599 00
Magnesite -----	300 tons	3,300 00
Mineral paint -----	90 tons	584 00
Paving blocks -----	60 M	2,220 00
Silver -----		2,585 00
Total -----		\$539,246 00

## PLUMAS COUNTY.

Mineral.	Quantity.	Value.
Gold -----		\$228,785 00
Lead -----	1,329 lbs.	60 00
Manganese -----	2 tons	40 00
Silver -----		1,125 00
Total -----		\$230,010 00

## RIVERSIDE COUNTY.

Mineral.	Quantity.	Value.
Brick -----	3,675 M	\$28,572 00
Clay -----	67,295 tons	79,961 00
Copper -----	6,753 lbs.	844 00
Crushed rock <sup>1</sup> -----	510,888 tons	453,724 00
Curbing -----	3,000 lin. ft.	1,800 00
Gems -----		250 00
Gold <sup>2</sup> -----		20,623 00
Granite -----	12,295 cu. ft.	10,555 00
Magnesite -----	575 tons	4,600 00
Mineral water -----	90,580 gals.	11,500 00
Paving blocks -----	126 M	7,939 00
Silver <sup>2</sup> -----		2,121 00
Total -----		\$622,489 00

<sup>1</sup>Macadam, rubble, sand and gravel.<sup>2</sup>Including small production from Los Angeles County.

## SACRAMENTO COUNTY.

Mineral.	Quantity.	Value.
Brick -----	13,017 M	\$76,571 00
Crushed rock -----	370,556 tons	131,037 00
Gold -----		1,812,826 00
Granite -----	45,630 cu. ft.	12,307 00
Natural gas -----		83,890 00
Silver -----		3,047 00
Total -----		\$2,109,678 00

<sup>1</sup>Low spot value due to prison labor.

## SAN BENITO COUNTY.

Mineral.	Quantity.	Value.
Crushed rock -----	250,322 tons	\$107,558 00
Mineral water -----	3,600 gals.	1,540 00
Quicksilver -----	9,775 flasks	449,748 00
Total -----		\$558,846 00

## SAN BERNARDINO COUNTY.

Mineral.	Quantity.	Value.
Brick -----	1,340 M	\$8,040 00
Clay -----	920 tons	4,060 00
Copper -----	666,489 lbs.	83,311 00
Crushed rock -----	154,841 tons	166,808 00
Gold -----		127,367 00
Gypsum -----	20,584 tons	66,505 00
Lead -----	161,338 lbs.	7,260 00
Limestone -----	245,102 tons	177,080 00
Marble -----	135 cu. ft.	405 00
Paving blocks -----	305 M	19,930 00
Salt -----	3,600 tons	13,800 00
Silver -----		35,542 00
Total -----		\$710,108 00

## SAN DIEGO COUNTY.

Mineral.	Quantity.	Value.
Brick -----	9,500 M	\$68,000 00
Crushed rock -----	191,004 tons	195,835 00
Gems -----		25,000 00
Mineral water -----	60,090 gals.	87,020 00
Paving blocks -----	109 M	5,653 00
Salt -----	13,000 tons	37,500 00
Total -----		\$419,008 00

NOTE.—Gold and silver output included in Imperial County totals.

## SAN FRANCISCO COUNTY.

Mineral.	Quantity.	Value.
Crushed rock -----	145,050 tons	\$119,636 00
Total -----		\$119,636 00

## SAN JOAQUIN COUNTY.

Mineral.	Quantity.	Value.
Brick -----	5,275 M	\$49,650 00
Clay -----	25,510 tons	25,510 00
Natural gas -----		114,433 00
Total -----		\$189,593 00

## SAN LUIS OBISPO COUNTY.

Mineral.	Quantity.	Value.
Bituminous rock -----	2,710 tons	\$5,230 00
Brick -----	2,000 M	18,000 00
Mineral water -----	2,000 gals.	1,000 00
Petroleum -----	38,092 bbls.	25,146 00
Quicksilver -----	569 flasks	26,180 00
Total -----		\$75,556 00

## SAN MATEO COUNTY.

Mineral.	Quantity.	Value.
Brick -----	1,350 M	\$43,000 00
Crushed rock -----	66,568 tons	61,185 00
Limestone -----	93,500 tons	74,800 00
Salt -----	27,500 tons	55,000 00
Total -----		\$233,985 00

## SANTA BARBARA COUNTY.

Mineral.	Quantity.	Value.
Brick -----	1,600 M	\$13,800 00
Clay -----	12,000 tons	16,000 00
Crushed rock -----	3,738 tons	6,602 00
Infusorial earth -----	1,344 tons	13,720 00
Limestone -----	4,239 tons	8,174 00
Mineral water -----	73,640 gals.	15,900 00
Natural gas -----		100,386 00
Petroleum <sup>1</sup> -----	6,766,156 bbls.	3,204,717 00
Quicksilver -----	50 flasks	2,301 00
Sandstone -----	58,976 cu. ft.	29,507 00
Total -----		\$3,411,107 00

<sup>1</sup>Includes 431,000 barrels, valued at \$202,570, used as fuel in field.

## SANTA CLARA COUNTY.

Mineral.	Quantity.	Value.
Brick -----	6,000 M	\$30,000 00
Crushed rock -----	116,875 tons	62,595 00
Limestone -----	2,417 tons	3,918 00
Mineral water -----	165,720 gals.	10,000 00
Petroleum -----	12,828 bbls.	8,505 00
Quicksilver -----	7,533 flasks	346,593 00
Total -----		\$461,611 00

## SANTA CRUZ COUNTY.

Mineral.	Quantity.	Value.
Bituminous rock -----	24,815 tons	\$80,371 00
Crushed rock -----	7,627 tons	7,627 00
Lime -----	216,508 bbls.	206,225 00
Limestone -----	22,622 tons	44,591 00
Total -----		\$338,814 00

## SHASTA COUNTY.

Mineral.	Quantity.	Value.
Brick -----	2,825 M	\$20,094 00
Chrome -----	875 tons	13,697 00
Copper -----	29,539,913 lbs.	3,692,489 00
Gold -----		1,059,881 00
Lead -----	881 lbs.	40 00
Lime -----	13,271 bbls.	10,164 00
Limestone -----	67,924 tons	65,253 00
Mineral water -----	25,000 gals.	6,250 00
Pyrite -----	47,885 tons	151,602 00
Silver -----		386,991 00
Total -----		\$5,406,461 00

## SIERRA COUNTY.

Mineral.	Quantity.	Value.
Gold -----		\$461,513 00
Silver -----		5,604 00
Total -----		\$467,117 00

## SISKIYOU COUNTY.

Mineral.	Quantity.	Value.
Crushed rock <sup>1</sup> -----	52,633 tons	\$6,580 00
Gems -----		1,000 00
Gold -----		422,297 00
Lime -----	150 bbls.	120 00
Limestone -----	24 tons	24 00
Mineral water -----	700,000 gals.	120,000 00
Sandstone -----	650 cu. ft.	455 00
Silver -----		2,561 00
Total -----		\$553,037 00

<sup>1</sup>Sand and gravel.

## SOLANO COUNTY.

Mineral.	Quantity.	Value.
Brick -----	500 M	\$4,000 00
Crushed rock -----	159,049 tons	127,589 00
Bituminous rock -----	47,600 tons	31,678 00
Mineral water -----	30,000 gals.	4,000 00
Natural gas -----		8,596 00
Paving blocks -----	263 M	12,685 00
Salt -----	100 tons	300 00
Total -----		\$188,848 00

## SONOMA COUNTY.

Mineral.	Quantity.	Value.
Crushed rock -----	55,292 tons	\$21,254 00
Curbing -----	3,700 lin. ft.	389 00
Mineral water -----	202,500 gals.	50,250 00
Paving blocks -----	3,278 M	162,392 00
Quicksilver -----	94 flasks	4,325 00
Total -----		\$238,610 00

## STANISLAUS COUNTY.

Mineral.	Quantity.	Value.
Brick -----	850 M	\$5,950 00
Gold <sup>1</sup> -----		307,538 00
Mineral paint -----	96 tons	600 00
Silver <sup>1</sup> -----		1,131 00
Total -----		\$315,219 00

<sup>1</sup>Includes Merced County production; also dredger production from Shasta and Trinity counties.

## TEHAMA COUNTY.

Mineral.	Quantity.	Value.
Mineral water -----	5,000 gals.	\$500 00
Total -----		\$500 00

## TRINITY COUNTY.

Mineral.	Quantity.	Value.
Gold -----		\$612,149 00
Quicksilver -----	44 flasks	2,024 00
Silver -----		6,777 00
Total -----		\$620,950 00

## TULARE COUNTY.

Mineral.	Quantity.	Value.
Brick -----	10,225 M	\$81,000 00
Gems -----		20,000 00
Magnesite -----	7,763 tons	57,335
Total -----		\$158,335 00

## TUOLUMNE COUNTY.

Mineral.	Quantity.	Value.
Gold -----		\$1,093,484 00
Lime -----	75,000 bbls.	70,000 00
Limestone -----	4,319 tons	13,609 00
Marble -----	18,966 cu. ft.	50,398 00
Silver -----		13,243 00
Total -----		\$1,240,734 00

## VENTURA COUNTY.

Mineral.	Quantity.	Value.
Brick -----	900 M	\$5,100 00
Clay -----	1,900 tons	1,900 00
Crushed rock -----	1,000 tons	750 00
Natural gas -----		2,958 00
Petroleum <sup>1</sup> -----	499,082 bbls.	349,777 00
Sandstone -----	4,658 cu. ft.	2,325 00
Total -----		\$362,810 00

<sup>1</sup>Includes 32,400 barrels, valued at \$22,680, used as fuel in field.

## YUBA COUNTY.

Mineral.	Quantity.	Value.
Crushed rock -----	47,555 tons	\$9,318 00
Gold -----		2,997,072 00
Silver -----		5,299 00
Total -----		\$3,011,689 00

## UNAPPORTIONED.

Mineral.	Quantity.	Value.
Barytes -----	309 tons	\$2,207 00
Brick -----	15,000 M	98,775 00
Borax -----	50,945 tons	1,456,672 00
Cement -----	6,371,369 bbls.	9,085,625 00
Coal -----	11,047 tons	18,297 00
Feldspar -----	740 tons	4,560 00
Fuller's earth -----	466 tons	5,294 00
Glass sand -----	8,620 tons	8,672 00
Iron -----	558 tons	558 00
Platinum -----	511 oz.	14,873 00
Soda -----	9,023 tons	52,887 00
Tungsten -----	4,856 tons	127,706 00
Zinc -----	2,679,842 lbs.	152,751 00
Total -----		\$11,028,877 00

# PUBLICATIONS OF THE CALIFORNIA STATE MINING BUREAU.

## REPORTS.

Asterisk (\*) indicates the publication is out of print.

*Report	I.	Henry G. Hanks.	1880.		
*Report	II.	Henry G. Hanks.	1882.		
*Report	III.	Henry G. Hanks.	1883.		
*Report	IV.	Henry G. Hanks.	1884.		
*Report	V.	Henry G. Hanks.	1885.		
*Report	VI—Part 1.	Henry G. Hanks.	1886.		
*Report	VI—Part 2.	Wm. Ireland, Jr.	1886.		
*Report	VII.	Wm. Ireland, Jr.	1887.		
*Report	VIII.	Wm. Ireland, Jr.	1888.		
*Report	IX.	Wm. Ireland, Jr.	1889.		
*Report	X.	Wm. Ireland, Jr.	1890.		
Report	XI.	Wm. Ireland, Jr.	1892. (First biennial.)	Price. \$1.00	Postage. \$.15
*Report	XII.	J. J. Crawford.	1894. (Second biennial.)		
*Report	XIII.	J. J. Crawford.	1893. (Third biennial.)		

## BULLETINS.

				Price.	Postage.
*Bulletin	1.	Dessicated Human Remains.—Winslow Anderson.	1888.		
*Bulletin	2.	Methods of Mine Timbering.—W. H. Storms.	1894.		
*Bulletin	3.	Gas and Petroleum Yielding Formations of the Central Valley of California.—W. L. Watts.	1894.		
*Bulletin	4.	Catalogue of California Fossils (Parts 2, 3, 4 and 5).—J. G. Cooper.	1894.		
*Bulletin	5.	The Cyanide Process: Its Practical Application and Economical Results.—A. Scheidel.	1894.		
Bulletin	6.	California Gold Mill Practices.—E. B. Preston.	1895.	\$ .50	\$ .04
*Bulletin	7.	Mineral Production of California, by Counties, 1894.—Chas. G. Yale.	(Tabulated sheet)		
*Bulletin	8.	Mineral Production of California, by Counties, 1895.—Chas. G. Yale.	(Tabulated sheet)		
Bulletin	9.	Mine Drainage, Pumps, etc.—Hans C. Behr.	1896.	.60	.08
*Bulletin	10.	A Bibliography Relating to the Geology, Palæontology, and Mineral Resources of California.—A. W. Vodge.	1896.		
*Bulletin	11.	Oil and Gas Yielding Formations of Los Angeles, Ventura, and Santa Barbara Counties.—W. L. Watts.	1896.		
*Bulletin	12.	Mineral Production of California, by Counties, 1896.—Chas. G. Yale.	(Tabulated sheet)		
*Bulletin	13.	Mineral Production of California, by Counties, 1897.—Chas. G. Yale.	(Tabulated sheet)		
*Bulletin	14.	Mineral Production of California, by Counties, 1898.—Chas. G. Yale.	(Tabulated sheet)		
Bulletin	15.	Map of Oil City Oil Fields, Fresno County.—J. H. Means.		.05	.02
*Bulletin	16.	The Genesis of Petroleum and Asphaltum in California.—A. S. Cooper.	1899.		
*Bulletin	17.	Mineral Production of California, by Counties, 1899.—Chas. G. Yale.	(Tabulated sheet)		
*Bulletin	18.	The Mother Lode Region of California.—W. H. Storms.	1900.		
*Bulletin	19.	Oil and Gas Yielding Formations of California.—W. L. Watts.	1900.		
*Bulletin	20.	Synopsis of Reports of State Mining Bureau.—W. L. Watts.	1900.		
*Bulletin	21.	Mineral Production of California, by Counties, 1900.—Chas. G. Yale.	(Tabulated sheet)		
*Bulletin	22.	Mineral Production of California for Fourteen Years.—Chas. G. Yale.	1900. (Tabulated sheet)		
Bulletin.		Reconnaissance of the Colorado Desert Mining District.—Stephen Bowers.	1901.		.02
Bulletin	23.	The Copper Resources of California.—P. C. DuBois, F. M. Anderson, J. H. Tibbits, and G. A. Tweedy.	1902.	.50	.12
*Bulletin	24.	The Saline Deposits of California.—G. E. Bailey.	1902.		
*Bulletin	25.	Mineral Production of California, by Counties, 1901.—Chas. G. Yale.	(Tabulated sheet)		
*Bulletin	26.	Mineral Production of California for Fifteen Years.—Chas. G. Yale.	1901. (Tabulated sheet)		
Bulletin	27.	The Quicksilver Resources of California.—Wm. Forstner.	1903.	.75	.14
*Bulletin	28.	Mineral Production of California, by Counties, 1902.—Chas. G. Yale.	(Tabulated sheet)		

## PUBLICATIONS OF THE CALIFORNIA STATE MINING BUREAU—Continued.

Asterisk (\*) indicates the publication is out of print.

		Price.	Postage.
*Bulletin 29.	Mineral Production of California for Sixteen Years.—Chas. G. Yale. 1902. (Tabulated sheet)-----		
*Bulletin 30.	A Bibliography of Geology, Palæontology, and Mineral Resources of California.—A. W. Vodges. 1903.-----		
Bulletin 31.	Chemical Analyses of California Petroleum.—H. N. Cooper. 1903. (Tabulated sheet)-----		\$.02
Bulletin 32.	Production and Use of Petroleum in California.—P. W. Prutzman. 1904-----	\$.25	.08
*Bulletin 33.	Mineral Production of California, by Counties, 1903.—Chas. G. Yale. (Tabulated sheet)-----		
*Bulletin 34.	Mineral Production of California for Seventeen Years.—Chas. G. Yale. 1903. (Tabulated sheet)-----		
*Bulletin 35.	Mines and Minerals of California for 1903.—Chas. G. Yale. 1904. (Statistical)-----		
*Bulletin 36.	Gold Dredging in California.—J. E. Doolittle. 1905-----		
Bulletin 37.	Gems, Jewelers' Materials, and Ornamental Stones of California.—George F. Kunz. 1905:-----		
	First edition (without colored plates)-----	.25	.08
	Second edition (with colored plates)-----	.50	.08
*Bulletin 38.	The Structural and Industrial Materials of California.—Wm. Forstner, T. C. Hopkins, O. Naramore, L. H. Eddy. 1906-----		
*Bulletin 39.	Mineral Production of California, by Counties, 1904.—Chas. G. Yale. (Tabulated sheet)-----		
*Bulletin 40.	Mineral Production of California for Eighteen Years.—Chas. G. Yale. 1904. (Tabulated sheet)-----		
*Bulletin 41.	Mines and Minerals of California for 1904.—Chas. G. Yale. (Statistical)-----		
*Bulletin 42.	Mineral Production of California, by Counties, 1905.—Chas. G. Yale. (Tabulated sheet)-----		
*Bulletin 43.	Mineral Production of California for Nineteen Years.—Chas. G. Yale. 1905. (Tabulated sheet)-----		
*Bulletin 44.	Mines and Minerals of California for 1905.—Chas. G. Yale. (Statistical)-----		
*Bulletin 45.	Auriferous Black Sands of California.—J. A. Edman. 1907-----		
Bulletin 46.	General Index to Publications of the State Mining Bureau.—Compiled by Chas. G. Yale. 1907-----	.30	.06
*Bulletin 47.	Mineral Production of California, by Counties, 1906.—Chas. G. Yale. (Tabulated sheet)-----		
*Bulletin 48.	Mineral Production of California for Twenty Years.—Chas. G. Yale. 1906. (Tabulated sheet)-----		
*Bulletin 49.	Mines and Minerals of California for 1906.—Chas. G. Yale. (Statistical)-----		
Bulletin 50.	The Copper Resources of California.—A. Hausmann, J. Kruttschnitt, Jr., W. E. Thorne, J. A. Edman. 1908-----	1.00	.20
*Bulletin 51.	Mineral Production of California, by Counties, 1907.—D. H. Walker, Statistician. (Tabulated sheet)-----		
*Bulletin 52.	Mineral Production of California for Twenty-one Years.—D. H. Walker, Statistician. 1907. (Tabulated sheet)-----		
*Bulletin 53.	Mineral Productions of California for 1907, with County Maps.—D. H. Walker, Statistician. 1908. (Statistical)-----		
*Bulletin 54.	Mineral Production of California, by Counties, 1908.—D. H. Walker, Statistician. (Tabulated sheet)-----		
*Bulletin 55.	Mineral Production of California for Twenty-two Years.—D. H. Walker, Statistician. 1908. (Tabulated sheet)-----		
*Bulletin 56.	Mineral Productions for 1908, County Maps, and Mining Laws of California.—D. H. Walker. 1909. (Statistical)-----		
Bulletin 57.	Gold Dredging in California.—W. B. Winston, Charles Janin. 1910-----	1.50	.15
*Bulletin 58.	Mineral Production of California, by Counties, 1909.—D. H. Walker, Statistician. (Tabulated sheet)-----		
*Bulletin 59.	Mineral Production of California for Twenty-three Years.—D. H. Walker, Statistician. 1909. (Tabulated sheet)-----		
*Bulletin 60.	Mineral Productions for 1909, County Maps, and Mining Laws of California.—D. H. Walker. 1910. (Statistical)-----		
Bulletin 61.	Mineral Production of California by Counties for 1910.—D. H. Walker, Statistician. (Tabulated sheet)-----		.02
Bulletin 62.	Mineral Production of California for Twenty-four Years.—D. H. Walker, Statistician. 1910. (Tabulated sheet)-----		.02
Bulletin 63.	Petroleum Development in Southern California.—P. W. Prutzman. 1912-----		
Bulletin 64.	Mineral Production for 1911.—E. S. Boalch, Statistician, 1912-----		

## PUBLICATIONS OF THE CALIFORNIA STATE MINING BUREAU—Continued.

Asterisk (\*) indicates the publication is out of print.

## REGISTERS OF MINES WITH MAPS.

	Price. Postage.	
Amador County .....	\$.25	\$.08
Butte County .....	.25	.08
*Calaveras County .....	---	---
*El Dorado County .....	---	---
*Inyo County .....	---	---
*Kern County .....	---	---
Lake County .....	.25	.08
Mariposa County .....	.25	.08
Nevada County .....	.25	.08
*Placer County .....	---	---
*Plumas County .....	---	---
*San Bernardino County .....	---	---
San Diego County .....	.25	.08
Santa Barbara County .....	.25	.08
*Shasta County .....	---	---
*Sierra County .....	---	---
*Siskiyou County .....	---	---
*Trinity County .....	---	---
Tuolumne County .....	.25	.08
Yuba County .....	.25	.08
Register of Oil Wells (with map), Los Angeles City .....	.35	.02

## OTHER MAPS.

California, Showing Mineral Deposits—		
Mounted .....	\$1.50	\$.20
Unmounted .....	.30	.15
Forest Reserves in California—		
Mounted .....	.50	.08
Unmounted .....	.30	.06
Mineral and Relief Map of California .....	.25	.05
El Dorado County, Showing Boundaries of National Forests .....	.20	.02
Madera County, Showing Boundaries of National Forests .....	.20	.02
Placer County, Showing Boundaries of National Forests .....	.20	.02
Shasta County, Showing Boundaries of National Forests .....	.20	.02
Sierra County, Showing Boundaries of National Forests .....	.20	.02
Siskiyou County, Showing Boundaries of National Forests .....	.20	.02
Trinity County, Showing Boundaries of National Forests .....	.45	.02
Tuolumne County, Showing Boundaries of National Forests .....	.20	.02
Mother Lode Region .....	.05	.02
Desert Region of Southern California .....	.10	.02
Minaret District, Madera County .....	.20	.02
Copper Deposits in California .....	.10	.02





**THIS BOOK IS DUE ON THE LAST DATE  
STAMPED BELOW**

**AN INITIAL FINE OF 25 CENTS**

WILL BE ASSESSED FOR FAILURE TO RETURN THIS BOOK  
ON THE DATE DUE. THE PENALTY WILL INCREASE TO  
50 CENTS ON THE FOURTH DAY AND TO \$1.00 ON THE  
SEVENTH DAY OVERDUE.

MAR 21 1966

MAR 21 1966

MAY 23 1966

MAY 23 1966

DEC 12 1988

RECEIVED

DEC 06 1988

PHYS SCI LIBRARY

Call Number:

181590

Calif. Dept. of natural  
resources. Div. of mines.  
Bulletin.

TN24

C3

A3

no. 64-66

Calif.

TN24

C3

A3

no. 64-66

PHYSICAL  
SCIENCES  
LIBRARY

LIBRARY  
UNIVERSITY OF CALIFORNIA  
DAVIS  
181590

3 1175 01262 5482

